THE MARINE REVIEW

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ANOTHER NEW YORK CONFERENCE.

Continuing their crusade for the revival of the declining commerce of the port and state of New York, business men representing the various boroughs of Greater New York held another conference Sept. 13 in the Hotel Astor. Among those present were Albert E. Henschel, who presided; Prof. Leslie J. Tompkins, of the law school of the University of New York; Jacob Erlich, manufacturer; Frederick C. Zobel, architect and builder; William Simmons, president of the Simmons Transportation Co.; Edward F. Linton, of Brooklyn, secretary of the Atlantic Avenue Improvement Association; Frank D. Cadmus, manager of Manhattan Rolling Mills; Edward P. Hatch, Jr., representing Lord & Taylor; B. J. Greenhut, of Greenhut & Co.; Fields Pendleton, of Pendleton Bros., vessel owners; Marcus H. Tracy, of F. N. Jarvis & Co., transportation; Louis A. Risse, ex-chief engineer of the board of public improvements of Greater New York; Daniel A. Cobb, Jr., and William H. Follette, mayor of Tonawanda and one of the largest canal boat owners in the state. In opening the conference Mr. Henschel said:

"There are certain well marked wrongs and evils, such as railroad rate discriminations against the state and port of New York, excessive terminal charges, inadequate and antiquated terminal arrangements, that need prompt correction, and it is our purpose at these meetings to confer with experts in the various lines of commerce, to listen to their suggestions as to proper modes of relief, and then, guided by this information, to translate these suggested reforms into remedial legislation. We favor the development of every avenue of commerce both by land and water. This means that due encouragement should be given to the extension and improvement of railways and waterways, without discriminating in favor of the one or against the other, for both, when properly developed and managed, complement and aid each other, and both are necessary to the well being of the state. When through short-sighted policy, the advocates of either would belittle the other, each is in the wrong, and the state, representing the collective interest of all, must step in to allow the best and largest development of both.

"In support of the work we are doing let me cite the language of President Roosevelt, who, as governor in 1900, submitted to the legislature the report of the commerce commission that had been appointed to investigate the decline of New York's commerce; Governor Roosevelt, in his message said: 'We cannot blink the fact that there has been a very serious loss in New York's commerce, and that the state cannot permit this loss to go unchecked. * * * We cannot afford to rest idle while our commerce is taken away from us, and we must act in the broadest and most liberal and most energetic spirit if we wish to retain the state's commercial supremacy.' Since this was written conditions have not improved, but have grown steadily worse, and the admonitions contained in that message are as forceful today as when they were issued."

Mayor Follette made a vigorous plea for a betterment of existing conditions, in the course of which he criticized the wharfage charges of New York City as excessive and having the effect of driving commerce from the city. He said in part:

"If New York, Buffalo and other interested cities would combine they could recover for this state and port commerce now diverted to Boston and Philadelphia. I am heartily in favor of the erection of free elevators, enough of which could be built at a cost of $1,000,000 to materially aid in retaining commerce." Mayor Follette criticized the present state of superintendent of canals, who, he said, has neglected these important waterways and allowed eel grass to grow to the hindrance of navigation. He said that breaks in the canal cost him personally a loss of $30,000 last year alone, and estimated that the damage they caused the commerce of the state was inestimable.

TORPEDO BOAT DESTROYER FOR BRAZIL.

The Piauhy, the second of 10 torpedo boat destroyers building for the Brazilian government by Yarrow & Co., Ltd., Glasgow, late of Poplar, London, was successfully launched on the Clyde on Sept. 7. The christening ceremony was performed by Senhora Burlamaqui, the wife of Capt. Burlamaqui, in the presence of His Excellency Admiral Duarte Huet de Bacellar, chief of the Brazilian Naval Commission, Capt. Almeida, chief of naval construction, Lieut. Com. Godofredo Silva and other officers of the Brazilian navy, including Capt. Frontin who will command the vessel.

The dimensions are as follows: Length, 240 ft.; beam, 23 ft. 6 in.; fitted with two sets of triple expansion

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four-cylinder engines balanced on the Yarrow, Schlick and Tweedy system, and two double-ended Yarrow boilers, each boiler being of about 4,000 H. P.

NEW LIFESAVING DEVICE.

Marine circles are interested in a device which it is said will shortly be placed on the market, consisting of a contrivance whereby a line can be fired from ship to shore, taking with it a sand anchor and thereby assisting the life savers in running out the breeches buoy to imperiled mariners. For years the custom has been to fire a line from shore to ship in an effort to land the buoy, and in rough weather this was hard work, also on many occasions the vessel was too far out for the line to reach her. The value of the invention, it is said, will result in the saving of more lives each year from stranded vessels.

The invention referred to makes fast the projectile fired to shore, regardless of the presence of men. This is called the Meyers-Rogers Automatic Anchoring Projectile. It is said that it has been approved after thorough tests, by the supervising board of inspectors. The projectile, which has a grapnel-shaped head, is fired from a cannon and it is said can be sent a quarter of a mile with a two-inch Manila rope attached. As the projectile will anchor automatically, communication is established independent of shore aid, and, the rope being heavy enough to support a number of men and a breeches buoy can be quickly operated over it even though the life savers were not on hand, the men simply making the end ashort taut and then running out the buoy to shore. The end of the rope left on board the ship is tied to the highest point aboard the vessel, a block is reeved into it, to which is hitched the breeches-buoy. The first man being a sailor, he takes with him attached to the block of the breeches buoy a line, and as he reaches shore he will haul in enough of this whip line to reach from the shore to the vessel, thus establishing an endless whip line, by means of which the breeches buoy can be operated back and forth to convey passengers from the wrecked vessel to the shore. The breaking of the rope in firing the projectile is prevented by a heavy spring, a sliding ring and cable, and the rope, after being fired 15 times, does not show the least wear.

There are very few ships, however, that go ashore that are not seen by the life savers day or night and immediate assistance is rendered.

NAMES FOR NEW WARSHIPS.

On Sept. 14 President Roosevelt authorized the assignment of names to the 10 torpedo boat destroyers authorized by the act of May 13, 1908, as follows: Hiram Paulding, Percival Drayton, Francis A. Roe, Edward Terry, George H. Perkins, Andrew Sterrett, Edward R. McCall, William Burrows, Lewis Warrington, John Mayran.

The 15 new submarines are to be named Stingray, Tarpon, Bonita, Snapper, Norwhal, Grayling, Salmon, Carp, Barracuda, Pickerel, Skate, Skipjack, Sturgeon, Thrasher and Tuna.

The colliers which are to be built will be called Jupiter and Cyclops and the colliers to be purchased, Vulcan, Mars and Hector.

Rear Admiral Hiram Paulding was distinguished for gallant service in 1812 and was assigned by President Lincoln to put the navy in a state of efficiency in 1861. Capt. Percival Drayton was Admiral Farragut's fleet captain in Mobile Bay. Rear Admiral Roe saw important service in the China seas and the civil war. Com. Edward Terry was commended for service during the civil war at the battle of Mobile Bay. Rear Admiral Perkins was commended by Admiral Farragut as an efficient officer, and Lieut. Andrew Sterrett commanded the Enterprise and captured a Tripolitan cruiser in 1801; threw her armament overboard, gave her crew one spar and a sail, and left them go. Capt. Edward R. McCall, Lieut. Burrows, Capt. Warrington, and Midshipman Mayran saw distinguished naval service, for which they were publicly commended.

TRAFFIC IN THE SUEZ CANAL.

Vice-Consul Dunlop, in his report on the trade and commerce of Port Said and the Suez canal for the year 1907, says that the volume of trade at Port Said continues to increase. Compared with 1905 and 1906, there was a decrease in exports, but large increases of imports and goods in transit. The total value in 1907 was £2,979,269 as against £2,476,942 in 1905. Syria came first in imports, furnishing most of the live stock, the United Kingdom second with coal, totalling 1,540,336 tons, and France third with flour. Since the opening of the main railway line to Cairo there has been a great increase of imports into the interior, the amounts for 1907 being 30,000 tons of general goods and 26,000 tons of coal. The increase in the coal traffic would be more pronounced but for the heavy cost of carriage, which is nearly 8s 6d per ton.

During the year 4,267 vessels of a net tonnage of 14,728,434, passed through the Suez canal in 1907 as compared with 3,975 vessels of 13,445,504 tons in 1906, showing an increase of 292 vessels and of 1,282,930 tons. Of these 4,267 vessels, 3,254 were merchant vessels (including 218 in ballast), 920 were mail steamers, and 93 warships and government transports. Out of the total of 4,267 vessels, 2,651 were British, an increase of 318 over 1906. The British net tonnage was 9,495,868, an increase of 1,195,937 tons over 1906. The British percentage of vessels has now risen from 58.7 to 62.1, and of net tonnage from 61.7 to 64.5 per cent. These figures apply to the general total, but, taking only merchant vessels, the British percentages are 75 per cent in number of vessels and 78 per cent in net tonnage.

These statistics, says the vice-consul, are most satisfactory in showing that the British relative position has improved in spite of competition. The German percentage has fallen in number of ships from 14.8 to 13.6 per cent, and of net tonnage from 16 to 15.3 per cent. France, the Netherlands, Austria-Hungary, Italy, Japan, Russia and Norway combined furnish a total of 20 per cent in number of vessels and 18 per cent in net tonnage.

HAWTHORNE, LESLIE & CO.

At the 23d annual meeting of the shareholders in Messrs. R. & W. Hawthorne, Leslie & Co., Ltd., engineers and ship builders at Newcastle-on-Tyne, Eng., recently, Sir Benjamin Brown presided.

In moving the adoption of the report, which showed an available balance of £36,686, from which a dividend of 6½ per cent per annum was to be deducted, leaving £8,115 to be carried forward, Sir Benjamin remarked on the state of the trade, saying that it had been very much hampered through strikes in the ship building and engineering trades. The engineers' strike still continued, the men resisting a reduction on the ground that they looked upon 36s a week as a minimum wage.

Sir Benjamin deprecated this policy of the men in refusing to bear with the employers the consequences of decreased business and also dwelt upon the action of the workmen in refusing to allow their leaders to negotiate agreements with the employers, thereby doing away with what is

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known as "collective bargaining." Believing therefore that the principle of a minimum wage was very injurious to the trade as a whole, and also that the whole question of collective bargaining and amicable relations with the men was at stake, the directors felt it their duty to resist the action of the men to the uttermost.

PEARL HARBOR, HAWAII.

The importance of opening an entrance to Pearl Harbor, T. H., and providing a place of shelter for our ships there was emphasized during the recent visit of our battleship fleet to Hawaii, when none of the fleet could coal at Honolulu with comfort and four of the vessels had to be sent 70 miles away to the island of Maui to take in coal. The neglect of Pearl Harbor since 1886, when we obtained control of it, has been scarcely less than criminal. It was not until 14 years later, in 1900, that congress made any appropriation for this harbor, and then only $150,000 to purchase a site there for a naval station, adding two years later $136,000 for the purchase of 725 acres of land, and $100,000 to dredge a channel in to the harbor, 250 ft. wide, 30 ft. deep and 1,500 ft. long.

Now congress has appropriated $1,000,000 to begin the work of improving the harbor according to the plans to be recommended by a board, of which Rear Admiral Schroeder is chairman. The language of the appropriation is as follows: "The secretary of the navy is hereby authorized and directed to establish a naval station at Pearl Harbor, Hawaii, on the site heretofore acquired for that purpose, and to erect thereat all necessary machine shops, storehouses, coal sheds and other necessary buildings, and to build thereat one graving dry dock capable of receiving the largest war vessel of the navy at a cost not to exceed $2,000,000 for said dry dock. The sums hereinafter stated are hereby appropriated and made immediately available at the discretion of the secretary of the navy, to wit: Toward dredging an entrance channel of a depth of 35 ft., $400,000; toward construction of a dry dock, $300,000; toward erection of machine shops (to cost $300,000), $100,000; toward erection of store houses (to cost $300,000), $100,000; toward yard development, $100,000. In all, $1,000,000."

In recommending this appropriation the naval committee of the house of representatives said: "In the judgment of your committee the new developments on the Pacific and among the nations that border on its shores make it imperative that a strong operating base be established for our navy at Pearl Harbor without further delay. A naval base at Pearl Harbor is not designed primarily for the protection of Hawaii. Its main purpose is to form a buffer of defense for our entire Pacific coast and to make possible our naval supremacy upon the Pacific. An enemy in the possession of Hawaii could harass and threaten our entire western coast. On the other hand, with our fleet operating from a well equipped base at Pearl Harbor no fleet from the Orient would find it practicable to threaten our coast because of the stronghold left in their rear and of the prohibitive distance from their coaling base. The equipment of Pearl Harbor is therefore a matter of prudence and not of extravagance. It will constitute one of the strongest factors in the prevention of war with any power in the far east."

It is hoped to have the entrance to Pearl Harbor clear early in 1910. The work of improving and fortifying this splendid land-locked harbor should proceed without delay. As Lieut. Comdr. Edward L. Beach, U. S. N., said in an article in the Proceedings of the United States Naval Institute: "In the possession of Hawaii our naval strength in the Pacific is immeasurably increased if Hawaii be secure from the enemy. But if the enemy take it and keep it our naval strength is weakened in the same ratio. Holding Hawaii, our Pacific coast is absolutely safe from attack."—*Army and Navy Journal.*

CLYDE TRUST AFFAIRS.

The Clyde Navigation trustees held their annual inspection of the docks, works and river recently, and at the meeting held in connection therewith heard the reports for the year ended June 30, 1908. The revenue for the year amounted to £556,965, of which sum £426,000 came from dues on goods and shipping, two-thirds from goods and one-third from shipping. The expenditures of the year had amounted to £503,000, which was an increase of £34,000. Two items were accountable for this, the increase in rates of interest, amounting to £10,000 and an expenditure under the head of dredging, amounting to £16,000, of which £6,000 was owing to the prevailing high price of coal. The balance for the year was £53,000, and this was applied to the sinking fund, which now stands at £666,000. In addition there was a revenue reserve fund of £1,393,000 or £2,000,000 that had been spent on the river more than they owed. That is to say, they had spent on the river, £8,962,000, and they owed £6,737,000. The capital expenditure for the past year had been £203,000, or £40,000 under the estimate. For the year now entered upon the capital expenditure was estimated at £288,000, but it was thought that they might look to some saving as the interest account would not increase and they would save some £6,000 on coal. Altogether it was believed that with the attractive port and moderate rates the Clyde Trust should continue to flourish.

SHIPPING AT JAPANESE PORTS.

E. F. Crowe, British commercial attache in Tokio, reports that during 1907 there was a considerable increase in the shipping, steam and sail, entered at Japanese ports.

The number of steamers entered was 10,965 of 20,199,653 tons, against 10,653 of 18,956,596 tons in 1906, an advance of 312 ships and 1,243,057 tons, or nearly 7 per cent. Sailing vessels also showed an increase, so that the figures for the total shipping were 13,831 of 20,336,695 tons, against 13,060 of 19,083,454 tons, a total gain of 771 ships and 1,253,241 tons, or 6 per cent.

The greatest advance is in steamers under the Japanese flag, the increase amounting to 524 vessels and 1,513,403 tons, or 20 per cent.

British shipping has made a substantial gain over 1906, amounting to 183 vessels and 500,968 tons, or more than 9 per cent.

The American flag, with a reduction of some 475,000 tons, has dropped back again to fourth place.

The ship building subsidy is likely to be increased. In 1907 it was only £81,500, while for this year the figures will exceed £203,000.

The necessity for this arises from the big ship building program which the three leading Japanese steamship companies have decided to carry out.

For the Nippon Yusen Kwaisha six steamers of 9,000 tons each have been ordered; the Osaka Shosen Kaisha are going to build six steamers of about 6,000 tons each for their new Pacific line, while one of three large turbiners being built to the order of the Toyo Kisen Kaisha at Nagaski has already performed her trials successfully. This company has also two large oil-tank steamers on order at the same yard.

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SHIP YARD NOTES.

Rohde & Sons, Baltimore, Md., have recently launched a pile driver hull 57 ft. in length, 24 ft. beam and 5½ ft. deep for Andrew Miller of the same city.

The Portland Ship Building Co., Portland, Ore., is rebuilding the ferry steamer W. S. Mason, which will be practically new when she again resumes her service on the Albina run.

The O'Rourke Dry Dock Co., Jersey City, is a new incorporation, with a capital stock of $50.000, which is operating a plant on the upper part of the Morris canal.

Sloan Bros., Seattle, Wash., have recently laid the keel for the new steamer which they are to build for the Vashon Steamboat Co. They expect to have the boat completed by November.

Brown & Sons, Tottenville, L. I., N. Y., launched the tug William J. Conway, building for Conway & Fox, of New York, Sept. 5. She will be used for harbor and Sound towing.

The Newport News Ship Building & Dry Dock Co., Newport News, Va., launched two more of the double-ended tow-barges which it is building for the Isthmian canal commission, on Sept. 5. They are to go at once to Panama loaded with coal.

The Newport News Ship Building & Dry Dock Co., Newport News, Va., will launch the steamer Southlands, building for the Norfolk & Washington Steamboat Co., on Saturday, Oct. 3. When completed this vessel will have cost about $500,000.

The Morse Dry Dock Co., Brooklyn, N. Y., recently completed extensive alterations to the American-Hawaiian line steamer Missouri, which has been renamed Missourian. Among the changes made was the installation of apparatus for the burning of oil fuel.

The Maryland Steel Co., Sparrow's Point, Md., has been awarded contract for the construction of the three new naval colliers, bids for which were opened at the navy department Sept. 1. The vessels are to cost $479,000 each and will be of 7,200 tons cargo capacity and 12 knots speed.

The ship yard at Bucksport, Me., which was conducted by the late Capt. Charles B. Dix, was sold at auction to Thomas Towle, of Portland, Me., recently. The arctic exploration ship Roosevelt, in which Commander Peary is now seeking to locate the north pole, was built at this yard. The new owner plans to put the plant to other uses.

William E. Woodall & Co., Baltimore, Md., are about to begin construction of two open lighters for the Southern Products Co., successor to the Baltimore Sanitary Contracting Co., of Baltimore. The vessels, which are to be 80 ft. long, 24 ft. beam and 7½ ft. deep, are to be used in the transportation of garbage and other matter to the new plant of the company on Bodkin Point.

The Bath Iron Works, Bath, Me., will probably resume work on the turbine steamer Belfast, which is under construction for the Eastern Steamship Co., in order that she may be completed for the Boston-Bangor service next season. No work has been done on the vessel since the Eastern Steamship Co. became involved in the financial difficulties which have beset the Morse combine.

A new ship yard has been established at Port Orchard, Wash., by T. A. Lund and S. Smith, who have purchased a site and are erecting ways to accommodate vessels up to 200 ft. in length.

G. M. Cochrane, Port Greville, Nova Scotia, launched the tern schooner Exilda on Aug. 11. The schooner was all rigged and ready for sea when launched. Her dimensions are as follows. Length, 144 ft. 9 in.; beam, 34 ft.; depth, 11 ft. 4 in. She registers 349 tons.

E. W. Heath, Tacoma, Wash., is preparing to complete the whaling steamer which has been on his ways for several months, and which is being built to the order of the Whale Products Co., of Tacoma. As the owners were in no haste to place the craft in commission work on it has been suspended for some time.

The Harlan & Hollingsworth Corp., Wilmington, Del., has been awarded contract by the Central Railroad of New Jersey for the construction of four steel steam lighters of the covered type for service in New York harbor.

The New London Marine Iron Works, New London, Conn., has been awarded contract for the construction of a large wooden scow for use on the government work to be done at Hell Gate, New York harbor. The cost of the vessel is to be $8,500.

A. D. Mills & Sons, Granville Ferry, Nova Scotia, launched the 200-ton schooner Katherine V. Mills recently. She is to be employed in the West India trade and is 100 ft. on the keel, 30 ft. beam and 11 ft. depth of hold.

The Drayton Harbor Oyster Co. recently launched a new oyster dredge which it has constructed at Eliza Island, Wash. The vessel was built at a cost of about $3,500.

The T. S. Marvel Ship Building Co., Newburgh, N. Y., has received an order to build a new steamer for the New York & Troy line to be a sister ship of the Trojan, which is now under construction at this yard. The new boat, which is to be 330 ft. in length, will be ready for service by May, 1909.

Crawford & Reid, Tacoma, Wash., are said to have secured a contract for constructing a new steamer for Matthew McDowell, of Seattle, to be operated between Seattle and Tacoma via East Pass points. The new steamer is to be 100 ft. long, and will be fited with every modern convenience for caring for the rapidly growing freight and passenger trade which Capt. McDowell has built up on that route. The engines are being constructed by the Hutton Machine Works at Seattle, and are calculated to give the vessel plenty of speed.

McIntyre & Henderson, Baltimore, Md., are completing a tug for stock. She is built of wood and is 67 ft. long, 16½ ft. beam and 7½ ft. deep. She is to have a single condensing engine with cylinder 14 in. in diameter, with 16-in. piston stroke. Her boiler, which has just been installed, is 6½ by 12 ft., with a working pressure of 130 pounds.

The Gas Engine & Power Co., and the Charles L. Seabury Co., Consolidated, Morris Heights, N. Y., have been awarded contract by Ex-Governor William L. Douglas, of Massachusetts, for the construction of a steel steam yacht of heavy material. She is to be 140 ft. over all, 19 ft. beam and 7½ ft. draught and will be equal to any of the foreign-built yachts now owned in America.

James & Tarr, Essex, Mass., launched a fishing schooner recently. She is 122 ft. long, 24 ft. beam and 12 ft. deep. She is to be fitted out at Gloucester, Mass.

The sale of the Neafie & Levy Ship Building plant at Philadelphia has not as yet been confirmed by the courts, and if it should be it is probable that but a small part of the claims of the creditors will be paid. The plant has now been closed three months.

A disastrous fire occurred on Aug. 22 in which the plant of the Norfolk Marine Railway Co. was partially destroyed. The carpenters' shed was a complete loss, together with the tools used in that department, and the office of the company was also considerably damaged.

The Metaline Transportation Co., Newport, Wash., expects to have the steamer Ruth, which it is building for service on the Pend Oreille river, ready for service in a few days. She is the strongest boat ever built at Newport as it is neces-

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sary that she traverse a very treacherous canon on her proposed route between Newport and Metaline, Wash.

The Spedden Ship Building Co., Baltimore, Md., have had the icebreaker Annapolis, owned by the Tolchester Beach Improvement Co., of Baltimore, on the ways for repairs. All the wooden buckets on her wheels were removed and steel ones substituted, her wheel frames were reinforced and other repairs effected.

IMPROVEMENTS IN COMPRESSIVE RIVETERS.*

BY CHESTER B. ALBREE.

The comparative advantages of the various forms of compressive riveters —hydraulic, hydro-pneumatic, direct pneumatic, and pneumatic toggle-joint and are fairly well understood. Each of them has certain advantages not possessed by the other. In this paper is described a new riveter in which some of the advantages of the various forms are combined, together with some additional improvements not hitherto attained. This riveter has the action of the toggle-joint type, with its increasing pressure toward the end of the stroke, where pressure is most needed in heading the rivet. It also has the valuable feature of the plain hydraulic machine in not requiring adjustment of the riveting jaws for work of different thicknesses. The machine is self-adjusting in this respect, and always gives the same terminal pressure, even though the thickness riveted may vary from one stroke to another.

The piston in the air cylinder is connected to the plunger by a toggle mechanism of the usual construction. The pressure from the toggle is transmitted to the top of the ram and also through a pipe to the adjusting cylinder. The ram being small in area and free to move, advances rapidly and continues until the rivet die on its extension strikes the projecting rivet. As the plunger continues, the pressure in the cylinder is limited by the pressure due to the spring in the adjusting cylinder, there being free communication to it. This pressure is only 20 lb. per sq. in., insufficient to upset the rivet beneath the ram. Hence the liquid will now displace the piston in the adjusting cylinder, the ram remaining stationary.

The extension of the plunger, when fully up, still projects into the smaller area of the ram cylinder; and that cup leathers are used to pack it. In the interior of this extension is a valve of the poppet type, but having a stem carrying on its end a small piston. This valve is normally held open by a spring. So long as the pressure above and below this small piston is the same, the spring holds the valve open, but when the pressure below is greater than above the piston will move up, closing the poppet valve. This occurs only when the port leading into the space below the small piston is closed, due to its passing from the large diameter bore to the smaller ram bore. When closed, the toggle pressure acts on the liquid below the plunger extension, raising the pressure sufficiently to move the small piston and connected valve, and later exerting very high pressure on the poppet valve, shutting it perfectly tight.

During the downward motion of the ram the liquid beneath it is forced into the opposite end of the adjusting cylinder, against the spring pressure. It is obvious that the ram may move its whole adjusting stroke, or not at all, up to the time when port is closed by entering the smaller diameter of the cylinder; after which the further travel of the ram is that of the plunger, until the ram meets opposition greater than the pressure of the toggle, when it will stop. This arrangement, therefore, automatically adjusts the point of maximum pressure to suit the work. On the return stroke we have the direct pressure beneath the ram, as well as the suction of the plunger, to raise the ram to its original position.

Leakage of the liquid is made up from a small storage or compensating cylinder, full of liquid, having a piston with a spring behind it, connected to the larger bore of the plunger by a pipe, having a check valve in it. Whenever there is pressure in the plunger cylinder, the check valve remains closed; but when the toggle is fully back, and the piston in the adjusting cylinder is against its cylinder head, so that no pressure due to its spring is exerted on the liquid, any loss of liquid will tend to create a vacuum in the plunger cylinder, and then the check valve will open, and oil flow out of the compensating cylinder under the pressure of the spring acting in its piston, to replace that which is lost.

*Abstracted from a paper read before the Engineers' Society of Western Pennsylvania.

A report is current to the effect that the 10,000-ton armored cruiser which is being built by the Orlando Dock Yard at Leghorn, Italy, is intended for the Japanese government. The vessel is a sister ship of the Italian cruisers Pisa and Amalfi.

TO CORRECT A FALSE HORIZON.

Captain Gadsen, a retired mariner, has invented an ingenious device, called the "Spanner horizon," which is intended to correct a false horizon, which the navigator dreads almost as much as he does the uncharted sunken rock, for he may be carried many miles out of his course, and not infrequently to a dangerous ambush in the pathless lane he is following. Ever since the time when the hardy Norsemen ventured out of sight of land, guided only by a rude compass, dependence has been placed upon the sea horizon for those observations of the celestial bodies which enabled the navigator to fix his position upon and shape his course across the vast expanse of the oceans. When the horizon is obscured the observations cannot be taken, and reliance—uncomfortable and uncertain—has to be placed on dead reckoning, the heaving of the lead line and the cries of the lookout. This is the case even when the sun or stars are shining brightly and only the horizon is obscured.

The great danger, and which has lured many a good ship to her destruction, is the counterfeit horizon, which appears so clear and well defined that it will deceive experienced navigators—men who have been deceived before by the same false assurance that they were looking upon the real horizon. Secure in the belief that his "sights are good," which is the nautical way of saying the safety signals are set, the mariner stands boldly on his course only to find that he is several miles out of his reckoning and has made a bad landfall. The false horizon at sea is as cruel a deception by Dame Nature as the mirage on land which presents to the thirsty traveler a limpid stream almost within reach of his hand. The spanner horizon is so called because it exactly spans the periphery of the sun's image reflected on the horizon glass of a sextant when day observations are taken. It carries a central wire for night work on which a star, a light ashore or afloat or other small object may be brought in line. On the darkest nights the altitudes of the stars may be taken with the spanner. In the daytime, when the horizon is obscured and the limbs of the sun are between the legs of the instrument, the altitude of the sun's center is obtained and the true horizon is established.—*Shipping Illustrated.*

The New Bedford line steamboat New Hampshire, rammed Mr. J. P. Morgan's yacht Corsair in the Fast river at New York a few days ago, while feeling her way down stream in a dense fog. The New Hampshire had a hole 20 f. long torn in her starboard side, while the Corsair lost her bowsprit and foremast, and her forward deckhouse was wrecked.

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ITEMS OF GENERAL INTEREST.

Capt. Michael Fitzgerald, a retired lake captain, formerly of Marine City, died at the home of relatives in North Dakota at the age of 87 years, last week.

The fastest warship in the world is without doubt the British special-type torpedo boat destroyer Swift, which on her preliminary trials maintained for some hours a speed of 38.3 knots—higher by three knots than the best four-hour performance ever achieved. Like all recent British warships, she is fitted with Parsons turbine machinery, designed to develop 30,000 H. P., and to give a speed of 36 knots. The furnaces are fitted for the consumption of oil fuel only. A remarkable feature of the Swift is her cost which amounts in the case of the hull and machinery to $1,237,310, and $14,150 for the armament, a total of $1,251,460, for a vessel of only 1,800 tons. The greater part of her cost is due to her speed, as was the case with the cruiser Indomitable, which had she been designed for 23 knots instead of 25 would have cost $1,500,000 less than she actually did, while if the Dreadnaught had been designed for 18.5 knots instead of 21, her cost would have been $2,150,000 less than it was.

Commander Davis, of the United States navy, has invented a remarkable double torpedo, which was tested by the government authorities. The torpedo consists of three parts: a Whitehead torpedo, 16 ft. long, a gun tube fitted into it, just as the torpedo tube fits into the submarine, and a projectile, which is driven from the gun by a charge of powder when the torpedo detonates upon contact. The projectile then penetrates the side of the vessel against which it is fired, and explodes by a time fuse. The idea is by no means a new one, but its success is rendered possible by using vanadium, which greatly toughens the steel tube. Com. Davis claims to have built a tube less than an inch thick, weighing only 350 pounds, but capable of projecting a 10-in. shell with an initial velocity of 1,100 ft. per second. At the official trials the torpedo tore a 6-ft. hole in a target.

The Japanese Imperial cabinet unanimously decided recently to prolong the present six-year scheme of improvements into 12 years, thereby contracting expenditure more than 200,000,000 yen, of which 150,000,000 belong to the army and navy. The new loans are entirely excluded in the 12-year scheme. The national railways will be made a separate account disconnected from the general budget, and the power of raising funds so limited as to adjust payments of principal and interest of all railway loans out of the railway profits. The government has also decided to pay off on account of the national debt every year not less than 150,000,000 yen.

Acting Secretary Wheeler, of the department of commerce and labor, has approved contracts aggregating $52,571 for improvements at Ellis Island, N. Y. The New York State Construction Co. was awarded contract for the construction of a wharf on its bid of $23,171, while the International Dredging Co., of New York, was awarded contract for dredging to the amount of $29,400. The improvements are for the purpose of relieving congestion at the present wharf caused by vessels docking to remove the baggage of aliens. Work is to be completed in 70 days.

The Newport conference of naval officers, who have been in session for some time, is reported to have discussed the criticisms of existing battleships very fully with the result that it will recommend to the board of construction that the armor belts on future warships be placed even lower than they are at present. This is in direct opposition to the contentions of the civilian naval critics who have so forcefully condemned the navy as it exists today.

Orders have been received by the commander of the torpedo boat and destroyer flotilla now at New Bedford, sending the whole fleet to Newport for the most important submarine test ever made in American waters. The entire fleet of submarine boats will be submerged on the mile line at Newport, to remain down for 48 hours, the longest and most severe test in the history of the navy. Thirty-four men will make the experiment, going down in the Octopus, Plunger, Tarantula, Viper and Cuttlefish. The compressed air in the tanks is generally put in to last 24 hours, but a double supply will be necessary. It is said that the longest the boats could remain under the surface with one charging of compressed air is 75 hours, and the 48-hour test is considered a particularly hard one, as it is not known from any former experience just how the boats will act after being submerged so long.

GULF PORT EXPORTS IN 1908.

BY WALTER J. BALLARD.

Though exports through our gulf ports last fiscal year were about $73,000,000 short of those for 1907 fiscal year, yet they totaled $396,522,136, or $33,000,000 a month. The distribution was:

Galveston	$161,352,201
New Orleans	159,455,773
Mobile	27,983,997
Pensacola	20,333,978
Sabine, Tex.	12,964,644
Pearl River, Miss.	7,755,843
Tampa	3,776,609
St. Marks, Fla.	1,945,144
Key West	764,017
Apalachicola, Fla.	219,930
Total	$396,522,136

Galveston fell off $72,000,000, and New Orleans $11,000,000, while Sabine, Texas, increased $10,000,000 (oil), and Mobile, $3,500,000.

SUMMARY OF NAVAL CONSTRUCTION.

The monthly summary of naval construction, issued by the bureau of construction and repairs, shows the following progress upon vessels:

Name of Vessel.	Building at—	—1908— Per cent of completion. Aug. 1.	Sept. 1.
BATTLESHIPS.			
South Carolina	Wm. Cramp & Sons	55.0	58.1
Michigan	New York S. B. Co.	60.4	65.1
Delaware	Newport News S. B. Co.	35.3	40.5
North Dakota	Fore River S. B. Co.	45.7	50.1
TORPEDO BOAT DESTROYERS.			
T. B. Destroyer No. 17	Wm. Cramp & Sons	38.7	49.3
T. B. Destroyer No. 18	Wm. Cramp & Sons	35.7	46.7
T. B. Destroyer No. 19	New York S. B. Co.	42.2	47.9
T. B. Destroyer No. 20	Bath Iron Works	14.0	20.1
T. B. Destroyer No. 21	Bath Iron Works	14.0	20.1
SUBMARINE TORPEDO BOATS.			
Submarine T. B. No. 13	Fore River S. B. Co.	51.9	55.7
Submarine T. B. No. 14	Fore River S. B. Co.	51.9	54.5
Submarine T. B. No. 15	Fore River S. B. Co.	50.9	54.1
Submarine T. B. No. 16	Fore River S. B. Co.	51.1	53.8
Submarine T. B. No. 17	Fore River S. B. Co.	42.4	48.2
Submarine T. B. No. 18	Fore River S. B. Co.	41.8	47.9
Submarine T. B. No. 19	Fore River S. B. Co.	41.3	46.8
COLLIERS.			
Vestal	Navy Yard, New York	92.8	95.2
Prometheus	Navy Yard, Mare Island	71.5	77.1
TUG BOATS.			
Patapsco	Navy Yard, Portsmouth	76.0	77.0
Patuxent	Navy Yard, Norfolk	78.0	88.0

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PACIFIC COAST NOTES.

Office of the MARINE REVIEW,
302 Pioneer Building,
Seattle, Wash., Sept. 18.

The first of the annual series of accidents due to the dense fogs which overhang Puget Sound nearly every morning in autumn occurred Saturday morning, Sept. 12, when the steel steamship Chippewa, bound to Victoria, crashed into the bow of the wooden steamer Sentinel in Elliot Bay within earshot of the Seattle docks. The Sentinel's bow was badly smashed and her repairs will require some time. Repairs are being made at King & Winge's shipyard at West Seattle. The Chippewa was uninjured. The Sentinel carried 75 passengers who were quickly transferred to the Chippewa, after which the little steamer was beached at West Seattle to prevent sinking. Both vessels were proceeding slowly or the collision would have been more disastrous. The Sentinel is owned by the Kitsap County Transportation Co., and is operated between Seattle and Liberty Bay.

The San Francisco Bridge Co. was awarded a contract on Sept. 15 for building the new transport docks at Fort Mason, San Francisco. The contract price is $1,248,000. The proposed work, on which construction will commence at once, includes the building of wharves, sheds, a sea wall and dredging the channel. The San Francisco Bridge Co. has contracted to do the entire work.

The contract for repairing the British steamer Beechley, which was badly damaged last summer and will require the renewal of several plates as well as strengthening the frames, has been awarded to Roger & Co., Portland, Ore., for the sum of $23,000.

The German ship Carl was the first of the annual fleet of sailing ships to clear from Puget Sound this fall with a cargo of wheat for Europe. The first steamer to leave was the British freighter Franklyn, 4,919 gross tons, loaded with 270,000 bushels. Other ships will be loaded in rapid succession, until the season's crop is taken care of.

The Steamer City of Seattle of the Pacific Coast Steamship Co.'s Alaska fleet, ran aground on the north end of Vancouver Island, Sept. 12, but later floated off with the high tide. She was placed on the floating dry dock of the Moran Co., examined and found not to be appreciably damaged.

The contract for the 100-ton floating pontoon crane for the Navy Yard, Puget Sound, Bremerton, Wash., has been awarded to Wellman-Seaver-Morgan Co., Cleveland. The contract price is $230,000. The new crane, the construction of which will commence immediately, will be used for lifting guns, turrets, machinery, etc., off and on ships.

The U. S. transport Dix, now lying in port at Seattle is to be repaired to the extent of $6,000. Maj. W. S. Wood, quartermaster, has not yet awarded the contract for the work, awaiting advice from Washington. The Dix will go into the dry dock at Bremerton Sept. 22, where she will undergo a general overhauling, including trimming the tail shaft and strengthening her superstructure.

Two new docks will be built shortly in Oregon. The Southern Pacific and O. R. & N. Co. will build a joint dock at Portland, Ore., 1,500 by 300 ft. in size, two stories high. This dock will extend from Albers dock on the north to the plant of the Portland Gas Co., on the south.

St. Johns, Ore., has disposed of bonds for a public dock to be located at the foot of Philadelphia street, and to be modelled after the Albina dock of the O. R. & N. Co. A portion of the new structure will be double decked for the accommodation of river boats. The work is in charge of C. E. Andrews, city engineer, St. Johns, Ore.

Mr. N. Thompson, Vancouver, B. C., is engaged in promoting a project to build a floating dock to cost $1,000,000.

BIDS FOR BUILDING TOWBOAT.

Bids received by Lieut-Col. J. G. Warren, corps of engineers, U. S. army, Cincinnati, O., for building a wooden hull towboat with snagging appliances, to be used on the Kentucky river, in Kentucky, were submitted by the Howard Ship Yards Co., Jeffersonville, Ind., and by J. M. Hammitt, Marietta, O. The former offers to build the vessel and equip it with new machinery throughout for $30,000, or if certain parts of the machinery taken from the U. S. steamer General O. M. Poe are used the vessel will be furnished at a cost of $24,600. On the proposal of the bidder to purchase the steamer O. M. Poe exclusive of furniture and furnishings the Howard company offers $1,000. Delivery of the new boat is promised in 150 days.

The bid of J. M. Hammitt was $32,575 for the construction of the new vessel using certain parts of the steamer General O. M. Poe, while his offer for the purchase of the latter vessel was $400. Delivery of the new boat is promised in 150 days.

MARINE ENGINE ENDURANCE.

That the marine engine builders of 25 years ago were accustomed to put the very best of materials and workmanship into ships of the first class is proved by the record of long and arduous service of the trans-Atlantic lines built during that period, a few of which are performing high-class service even today, says the *Scientific American*. A notable case of this is that famous old vessel, the Etruria, built in 1885, which soon after her entry into service captured the trans-Atlantic record with an average speed for the whole trans-Atlantic trip of 19.5 knots. Although the ship is entering on her twenty-fourth year of service, she is capable today of making her 18.5 knots an hour under favorable conditions of weather.

But, for the marine engineer, the points of interest about this ship are to be found in her engine and boiler rooms. The Etruria is the last of the large ships to be fitted with a single propeller; and her engine is one of the heaviest and largest single engines ever built, the individual parts being of great size and weight. Thus, the crankshaft, which is 25 in. in diameter, weighs 27 tons; the connecting rod, 13¼ in. in diameter at its center, weighs just under 11 tons; and the piston rods, which are 11¾ in. in diameter, weigh about four tons apiece. A single propeller blade weighs six tons, and the whole propeller complete 37 tons. The engine is compound, with one 71-in. and two 105-in. cylinders, the stroke being 6 ft.

During a recent visit to the engine room, made for the express purpose of seeing how the engines had stood the heavy strain of their 23 years of service, our representative was surprised to learn that, with the exception of the crankshaft and the tail shaft (the parts of a marine engine which are always subject to more rapid deterioration than the rest of the plant) this engine is in all its parts identically the same as when it left the builder's hands, not even the brasses having been renewed.

And even more remarkable evidence of good workmanship and careful attention is shown in the boiler room, which contains the same Scotch boilers that were put in nearly a quarter of a century ago. These boilers have the same tube plates, 15 per cent of the original tubes, and, most remarkable of all, the same corrugated furnaces as when they left the builder's hands. The ship must have paid for herself many times over; and her record stands as a protest against the cheaper materials and more hasty workmanship that have been developed by the present-day demand for cheaper ships.

Dean Bros.' Steam Pump Works, Indianapolis, Ind., have just issued catalog No. 71 descriptive of their power pumps. All the types illustrated in the catalog may be driven by belt, electric motor or other power.

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FOR VICTORY THIS TIME.

President Roosevelt and Judge Taft will not let congress forget, when it reassembles next December, that there is one piece of unfinished business, a great and urgent measure of business, which must be enacted long before March 4, 1909, signalizes the outgoing of the old and the incoming of the new administration.

In his annual message to congress a year ago, President Roosevelt declared for the immediate passage of an ocean mail law, like that which a partisan filibuster had defeated in the senate nine months before. Such a bill was promptly introduced into both houses. It was vigorously championed by Senator Gallinger, reported favorably from Senator Frye's committee on commerce, and passed by the senate without a division and without a dissenting vote.

In the house the committee on post office and post roads had already begun consideration of an ocean mail measure, and the sub-committee having it in charge had ordered a favorable report upon it. But the full committee, by a tie vote, failed to report this measure to the house. When the post office bill came up for consideration in conference, the senate committee on post office and post roads embodied the ocean mail bill, as passed by the senate, in the regular appropriation bill. This was accepted by the house conferrees, but the house itself, by the close vote of 145 to 153, rejected the measure as an amendment to the appropriation bill.

Now the ocean mail bill, as passed by the senate, will come up next December in the house committee on post office and post roads. A favorable report from the committee and a sufficient majority to pass the measure in the house are confidently anticipated by the leaders of the administration. So narrow was the division of last May—a change of five votes would have turned the scale—that there is every reason to believe that the requisite strength will now easily be forthcoming. Some of the representatives who were individually favorable to ocean mail legislation did not wish to embody this measure in a regular appropriation bill; they did not regard that as the best way to legislate. Other representatives, many of them from the middle western states, thought that their people had not been sufficiently educated on the question, and that their representatives ought not to be compelled to declare themselves on it in advance of a hotly contested national election. But these men will have recovered from their scare by next December. Moreover, the process will be the natural and simple one of considering and passing an independent bill which the president has recommended and the senate has approved with practical unanimity.

All conditions, therefore, are highly favorable for the final enactment of the ocean mail bill some time between Dec. 7, 1908, and March 4, 1909—the earlier the better. A determined effort is on foot to make this result absolutely certain. Judge Taft, in his letter accepting the Republican presidential nomination, followed up his previous declarations on this subject by specifically endorsing this ocean mail bill in the most emphatic way. Those public men who have referred to the question in their campaign addresses thus far have found that nothing awoke a more enthusiastic response from their audiences.

The sight of our great battleship fleet convoyed and lifted along the Australian coast, as it was a year ago along the coast of South America, by an auxiliary fleet of motley foreign "tramps," is enough to make intelligent Americans fighting mad with the policy of neglect of our own merchant flag which has made this disgrace and menace possible.

We have 16 first class battleships and a formidable fleet of armored cruisers in the Pacific ocean, and there are just seven American merchant steamers engaged in the trade between our coasts and Japan, China and the Philippines. We are making a great show of our mailed fist on the Pacific to impress the world, and there is not an admiralty between Tokio and London that does not know that this "triumphal" voyage of the American battleship fleet could not be repeated in actual war, because of our lack of an auxiliary fleet, and that, therefore, this peaceful parade is an egregrious humbug.

Every ton of coal delivered by a chartered collier in Australasia or in Manila Bay to enable our mighty battleships to continue their cruise was brought in a foreign "tramp," the use of which in war would be prohibited by international law and forbidden by every consideration of decency and safety. Our battleships could get no mail when they looked for it in Australian waters because congress, a year ago, killed our one Australian mail line by refusing to pay it even a compensation lower than that given for similar service by any other nation in the world. Officers of the fleet dispatched from San Francisco to join it in Australian

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ports were forced to take passage in a cheap, slow, crazy British "tramp," the Aeon, that tumbled up on the reefs the other day, a total wreck, on Christmas Island. This craft was not equipped or fit for carrying passengers, and could not carry passengers under American law, so that the officers and their families were compelled to ship nominally as members of the crew.

As if this disgrace were not enough, the sailing of the battleships from Albany, West Australia, for Manila Bay was delayed by the careless navigation and wretched slowness and inefficiency of the foreign "tramps," or, as the cable dispatches put it, "by the unreliability of the chartered colliers, a circumstance which in war times might be attended with most serious results."

When the battleships finally reach Manila they will find more foreign "tramp" colliers waiting for them there—or there is just as much reason to believe that they will have to wait there for these foreign colliers. Another circumstance calculated to sting the pride of every real American is the fact that the other day two 8-inch cannon for the fortifications in the Philippines and 500 rifles and 20,000 rounds of ammunition for the army in the islands were sent out from San Francisco in the Japanese subsidized steamship Nippon Maru—and sent that way because it was the only way to get them to their destination. Only one American steamship runs from San Francisco to the Philippines, and not one from Puget Sound. Until a few months ago two American steamships did run from Tacoma and Seattle to Manila via Hong Kong, but they could not compete with foreign subsidized craft in the oriental trade, and are now laid up and are awaiting purchasers.

These are some of the facts which will confront congress when it meets next December. These are some of the reasons to believe that positive action by our national lawmakers, in favor not only of mail lines but cargo carriers, flying the American flag and owned and run in American interests, cannot much longer be delayed. In February the battleship fleet is due at Hampton Roads on its return from its world-encircling cruise. It will bring 13,000 officers and men, who have not seen the Stars and Stripes afloat since they left home, save, perhaps, as it was hoisted in salute by some foreign admiral.

MR. GOULDER RETURNS FROM ABROAD.

Harvey D. Goulder, counsel for the Lake Carriers' Association, returned from England last week. Mr. Goulder's entire visit abroad was spent in London. He took occasion to make an inquiry into the state of shipping and the general conditions surrounding its operation. His observations will be embodied in a report to the Lake Carriers' Association, but Mr. Goulder does not feel at liberty to discuss them in the absence of President Livingstone, who is attending the bankers' convention in Denver. Mr. Goulder greatly enjoyed his visit abroad and is looking remarkably well.

Among the first things to engage his attention upon his return will be the nature of the lease to be executed by the passenger lines for dock room in the outer harbor at Cleveland. The passenger lines have a considerable investment at present in river frontage which obviously they do not desire to abandon at a great sacrifice. He believes that the lake front lease should be made upon generous lines by the municipality, as the municipality has more to gain by the transfer than the steamship lines.

STEAMER W. G. MATHER DAMAGED.

The steamer Wm. G. Mather of the Cleveland-Cliffs Iron Co.'s fleet sank in Ashtabula harbor as a result of striking the lost anchor of the steamer F. B. Wells. The Mather lightered and later was taken to Toledo for repairs. This anchor had been lying in Ashtabula harbor for a full year practically. Several vessels struck it and were slightly damaged, but it remained for the serious accident to the Mather to cause its removal. Vessel men are free to say that some one was remiss in not removing this anchor long ago. Its presence in the channel has cost the underwriters a tidy sum of money. The steamer Wm. F. Fitch hit it a few days earlier than the Mather, compelling her to go into dry dock at Cleveland for the removal of nine plates. The cost of removing this anchor amounted to only a few hundred dollars, whereas the cost of repairing the ships damaged by colliding with it has amounted to over $100,000.

LAKE FREIGHT SITUATION.

Weather conditions on the great lakes during the past six weeks have been unusual. While the lakes have been free from fogs and storms, or any suggestion of storm, as placid practically as the proverbial mill storm, still navigation has been seriously hampered, and even suspended, by smoke. The prevailing drouth, almost continental in extent, has caused fires to rage unchecked in sparsely settled communities, destroying mile after mile of forest and causing dense black smoke to drift over the surface of the whole chain of lakes, covering a distance of 1,000 miles. So dense has it been in the rivers during the past week that navigation was suspended at the Sault and no boats whatever were moving. The fog signal at Mackinaw has been blowing steadily for over 200 hours. The navigation of vessels in restricted channels is attended with great danger. Strandings are frequent and costly. The lethargy now affecting industrial conditions in the country makes vessel owners regard the situation with tolerance, but in any other season than this such a condition would be nerve-destroying. As it is, accidents are numerous, but they would be far more numerous were the entire fleet in commission and a demand for ore ruling. As it is, the delay is not sensibly felt by shippers. The movement of ore continues slight and shippers have little occasion to charter wild vessels.

The coal movement is also light. Grain is moving freely. The grain trade in itself is mighty slim picking when there are so many idle vessels. Vessel owners are uttering fervid prayers that the season of 1908 will never be repeated on the great lakes.

REACHING THE CLEVELAND FURNACE CO.'S DOCK.

The new 1,000-ft. concrete dock of the Cleveland Furnace Co. was visited by a committee of the chamber of commerce on a tug last week. At the same time a vessel loaded with limestone delivered a cargo at the dock. The Cleveland Furnace Co. began the erection of its plant in the upper reaches of the Cuyahoga river before navigation was possible there, receiving its ore meanwhile by rail over the Valley dock. The upper river has been greatly improved during the past two years by the Cleveland Furnace Co., the American Steel & Wire Co., Corrigan, McKinney & Co., and the Upson Nut Co., and these firms joined in asking the city to straighten and further develop the river.

The name of the monitor Wyoming will be changed to Cheyenne.

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PROGRESS ON BARGE CANAL.

The $101,000,000 barge canal and the Oswego and Champlain canals, which are now under construction by the state of New York, have been the subject of much comment of late because of the delay in preparing plans, awarding contracts and pushing work after awards have been made.

The New York Journal of Commerce and Commercial Bulletin, recently asked commander Albert Brooks Fry, a member of the advisory board of consulting engineers, to make a detailed statement showing as nearly as possible the conditions to date.

The advisory board is made up of Edward A. Bond, chairman, W. A. Brackenridge, M. G. Barnes, Alfred Brooks Fry and Thomas W. Symons, and was created to act as an intermediary between the people and the state, which through the state engineers' department is conducting the work.

Commander Fry states that there has been a certain amount of criticism of the barge canal work which is not entirely justified, having failed to take into account several factors of moment. He therefore points out:

"(1) The length of the combined canal systems, which aggregates 445 miles, much of it through thickly settled communities.

"(2) Lack of full appreciation of the climatic and physical difficulties.

"(3) The need of carefully regarding the vested rights of municipalities, corporations and individuals.

"(4) The fact that the original surveys for this work were preliminary, and while the utmost care was used that circumstances permitted, it has of course been necessary to make careful borings and final examinations to ascertain the best and most economical location for certain lines. Further, a portion of the lines originally surveyed were alternative, and selection among the alternatives presented could only be made after careful study based on detailed examinations, borings, etc.

"(5) Moreover, judging by statements that have appeared in the public press, there is a very wide misapprehension as to the time this work has been in actual progress. It has been the custom seemingly to regard said work as dating from Barge Canal Act of 1903, but said act did not become effective until November of that year, and organization under it was not completed until after March of 1904. Because of legal and other complications and change of state administration of said year, the first contracts were not entered into until April and May of 1905, and the first actual work of construction did not begin until April 24, 1905, when at Fort Miller a cut opening a temporary canal on the Champlain line was begun. Thus it will be seen that, as a matter of fact, work referred to has not yet been in actual progress three calendar years.

"But with all these things taken into consideration, in many particulars I am not satisfied with the progress being made, which makes it impossible to estimate with the slightest degree of accuracy the length of time necessary for the opening of the improvement canals to commerce.

"While there are notable exceptions, it appears that many of the canal contractors are economizing in the matter of machinery to the detriment of the state's interests. In many cases they have only one dredge in operation where several are needed. This is particularly the case with the Empire Engineering Corporation, which has several very important contracts."

Commander Fry has prepared a table showing actual progress of work on 25 contracts, giving in each instance the percentage done and that which should have been done, to date. This table, which is reproduced herewith, makes a poor showing for some of the contractors.

Discussing the canal question in a general way Commander Fry said:

"There is one feature of the New York barge canal system now under construction that it is well perhaps to bring to the attention of those interested in transportation matters, and that is the possible availability for general service of vessels built primarily for barge canal purposes.

"The action of the state officers concerned and of the advisory board has led to the installation of locks 328 ft. in length, 12 ft. in depth and 45 ft. in width, the latter dimension having been increased from that originally proposed, i. e., 28 ft. This action will enable us to follow the best European modern canal practice, and use, for example, if desired, barges over 200 ft. in length, of a beam between 30 and 40 ft., and any draft less than 10 feet. Thus, assuming proper hull construction and model, it is entirely practicable to infer the barge canal may have in service vessels capable of carrying from 1,000 to 1,500 tons or more.

"The tendency in Europe and in the south and west in this country has been not to build deep and narrow prisms and locks, but wide ones of moderate depth; moreover, not to use floating square-end boxes of the present Erie Canal type, but to use barges with proper bows, decent lines and a reasonably clean run. In Europe the spoon-bow boat seems to be looked on with favor, and barges usually

IMPROVEMENT OF THE ERIE, OSWEGO AND CHAMPLAIN CANALS.
STATEMENT BY ENGINEER FRY OF WORK UNDER CONTRACT AUG. 1, 1908.

Contract No.	Canal.	Section.	Contractor—	Amount of contract.	Date of contract	Date to be completed.	Per cent done.	Per cent shou'd be done to date.	Total payments to date.
1	Champlain	2	Empire Engineering Corporation	$ 607,421	4-18-05	10- 1-09	66.5	73.1	$363,429
2	Erie	1	The Ferguson Contracting Co.	906,894	4- 3-05	11- 1-08	60.7	93.0	495,135
3	Champlain	2	Sundstrom & Stratton	657,273	4- 4-05	12- 1-08	84.0	90.9	497,484
4	Erie	5	Empire Engineering Corporation	729,568	4-18-05	5-15-09	42.9	80.6	281,259
5	Erie	7	Empire Engineering Corporation	375,872	4-18-05	11-15-07	33.5	100.0	113,238
6	Erie	9	Frank A. Moselli	1,024,256	5- 3-05	11-15-09	59.6	71 6	550.521
7	Erie & Champlain	1-5-7-9-2	Croton Bridge Co.	101,929	8-10-06	7- 1-07	61.8	100.0	56,779
8	Erie	2	Pittsburg-Eastern Co.	1,451,512	5-22-06	7- 1-10	16.1	52.1	210,312
9	Erie	10	Thos Crimmins Contracting Co.	755,995	3-18-08	5- 1-10	2.0	16.0	13,626
10	Oswego	1	Mosier & Summers	1,107,610	6- 7-06	7- 1-09	14.2	69.4	140.940
11	Erie	1	Fort Orange Construction Co.	1,343 165	5-21-06	10- 1-09	28.9	65.0	349,857
12	Erie	6-7	Stewart, Kerbaugh & Shanley Co.	3 391,834	9-23-07	11- 1-11	3.0	18.8	91,917
14	Erie	1-2-3	Acme Engineering & Contracting Co.	2,944,703	9-10-07	4- 1-12	3.5	8 3	92,772
15	Champlain	3	Atlantic, Gulf & Pacific Co.	1,523,820	8- 9-06	8- 1-10	33.0	40.0	452,664
16	Erie & Champlain	—	United Construction Co.	63,473	12-20-06	1- 1-09	....	....	.....
17	Erie	3	The Scofield Co.	834 843	12-29-06	1- 1-10	6.9	....	.....
17	Erie	3	Alexander Murdock	806,455	3- 3-08	10- 1-11	4.4	11.6	31,914
18	Erie	4	O'Brien & Haolihon Contracting Co.	855 002	12-28-06	12-20-10	28.2	38.3	216,765
19	Erie	11	Great Lakes Construction Co.	892,991	11-26-06	12-31-10	11.5	39 6	92,124
25	Champlain	3	Atlantic, Gulf & Pacific Co.	1,717 649	11-19-06	10- 1-11	17.2	24.0	265,581
26	Champlain	2	Lake Erie Dredging Co.	59,795	4- 6-08	12- 1-09	....	....	.....
27	Champlain	2	Kinser Construction Co.	968,295	11-23-06	12-30-09	15.6	52.8	135.810
34	Erie	1	M. Fitzgerald	22,449	8- 8-06	5-31-07	89.5	100 0	18,117
35	Oswego	1	Gilmore, Horton, Allen Co.	745,968	9-16-07	8- 1-11	4 5	24.0	29 889
45	Erie	6	Scott Brothers	467,514	5- 6-08	5-20-11	3.0	6.6	12,771

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draw 8 ft. or less; even where 10 or 12 ft. depth is available, experience showing that a reasonable depth of water beneath the hull is a most material factor in lessening resistance against the hull's movement.

"The new barge canals will readily lock barges up to say, 300 ft. in length, with 40 ft. beam and 10 ft. draught, though in future years some curves may have to be eased and some parts of the land line prisms widened in order to make the use of vessels of this size, on the canals, readily practicable. A barge of the dimensions above given would displace about 3,300 long tons in fresh water, and with a reasonable design of hull and moderate steam power should be able to carry 2,500 tons or more of cargo.

"Let me say that I have no desire to assume the disguise of a deep waterway 'fiend,' nor within my lifetime do I hope to see New York Bay the fall and spring harbor of Montreal. But I do ask you to look upon the map in the same spirit that actuates the chess player when he tries to anticipate his opponent's most dangerous move; in the same spirit that the wise general seeks to maintain a reserve; or causes a prudent seaman to remember where lies his harbor of refuge. Due north of New York City, about 384 miles, lies Montreal, the commercial capital of the great Canadian Dominion. When our barge canal system is completed, remember that 10 ft. draught can reach, say to Rouses Point, within 50 miles by land of Montreal. Remember, too, that of the 323 miles of inland navigaton between the Battery and Rouses Point, only about 35 miles will be in land line, or greatly restricted waterway. The remainder lies in the Hudson river and in Lake Champlain, with channels 200 ft. or more in width, and 12 ft. in depth, and for 150 miles, let us say, over 18 ft. in depth. This last is a material factor even for barge navigation, because it means less resistance to a passing hull, therefore less coal and more speed. Moreover, I confess I am a believer in the ultimate construction of the so-called Georgian Bay Canal. It is a subject that has, of course, been for years agitated. Its estimated cost, say $68,000,000, is great. Its season of navigation is possibly somewhat shorter than that of the lower lakes, but on the other hand no objection that has been made to the Georgian Bay project, either from a physical or financial standpoint, is any more strenuous than history shows us was made against our triumphant Erie, or against that great highway to the East, the Suez, to the Isthmian Canal now under construction, or to our own barge canal system.

"I am not one who believes that the cities of Detroit, Toledo, Cleveland, Erie or Buffalo, will fall into decay if the Georgian Bay Canal be constructed; but I do belive that assuming said construction, it is wise for us New Yorkers to look for the means by which, to the profit of Canada and ourselves, such portions of the traffic to Montreal as will bear transshipment go out via a canal to Lake Champlain, the Hudson and the port of New York. The dangers and difficulties of spring and fall navigation in the Gulf of St. Lawrence are too well known to need restating here; and the fact that much Canadian produce could be loaded in barges and steam propellers of fair tonnage for distribution along our own coast is well worth remembering. Moreover, it is a question of but a short time when the products heretofore obtained from our Eastern forests must be replaced by the wood of Canada, and the abundant water powers along Lake Champlain and our northern frontiers may encourage the establishment of new woodworking centers.

"What effect the construction of the Georgian Bay Canal would have on commerce or what share a decent Champlain connection might bring to us, is a matter of conjecture, but sooner or later I believe the Georgian Bay Canal will come, and even if it does not, it is believed that by an expenditure of less than $14,000,000 it is possible for either the Canadian government or private parties to make navigable a direct waterway between Montreal and Lake Champlain via St. Johns and the Richelieu river, for vessels that may carry 2,000 tons or more, or they, at relatively small cost, may improve the present Chambly Canal, the locks thereon at present being but 118 by 23 by 7 ft., and the river not admitting of much more draught of water.

"I want us to be alive to all these possibilities, and in detail, each for himself, to think out how we can best avail ourselves of them for the welfare of our state and of our nation."

ENGINEERING TREATISES.

A series of engineering treatises or bulletins is promised by the Wheeler Condenser & Engineering Co., of Carteret, N. J., who are just now distributing a 16-page Bulletin No. 101, which outlines this company's facilities and products, including Wheeler-Admiralty Surface Condensers, Wheeler Jet and Barometric Condensers, Wheeler-Edwards Patent Air Pump, Wheeler-Volz Combined Condenser and Feed Water Heaters, Wheeler Feed Water Heaters, Wheeler Improved Re-Heaters and Receivers, Wheeler Vertical Engines, Wheeler Centrifugal Pumps, Wheeler Rotative Dry Vacuum Pumps, Wheeler-Barnard Water Cooling Towers, Wheeler Vacuum Pans, and Multiple Effects for sugar and chemical works, etc. Succeeding numbers will contain in addition useful and practical information, tables, etc., on condensing work and allied branches of engineering, thus becoming not only a continued catalog but also a record of progress in condensing, vacuum, distilling, feed water heating and pumping apparatus. The Wheeler company kindly offers to place the name of anyone interested in these subjects on its mailing list, and tenders the aid of its engineering staff in the designing and layout of plants where such equipment may be required.

FLOATING MACHINE SHOP FOR ELECTRIC BOAT CO.

The wooden schooner William F. Green, of Boston, has been purchased by the Electric Boat Co., of Quincy, Mass., and will at once be converted into a floating machine shop to be used during the trials of their submarine torpedo boats. Accommodations will also be fitted for berthing and messing the machinists and the crews of the submarines during maneuvers. The seven submarines now under construction for the navy department of the United States will begin their speed trials and endurance tests sometime in the early spring of the coming year. Although the schooner William F. Green is not a very new craft she was before being purchased by the Electric Boat Co., thoroughly inspected by superintending shipwright, William H. Godfrey.

BOAT DUMPING MACHINE.

The McMyler Mfg. Co., Cleveland, O., have recently closed a contract for a large coal handling plant to be located in Philadelphia. This plant contains a very novel device—a machine to take a boat out of the water, elevate it about 60 ft. in the air, and turn it upside down to discharge the coal.

The coal after being discharged may be delivered into other vessels or conveyed into storage. Means is also provided for taking coal out of storage and delivering it into vessels. Provision is made for screening the coal and handling it with minimum breakage.

Bids were opened at Albany last week for barge canal work on contract No. 66 east of Lockport. There were two bidders, E. M. Graves, of Cleveland, at $791,191, and the Empire Engineering Corporation of New York

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PIG IRON SITUATION.

The pig iron market shows little sign of life, the only inquiry of importance being for basic iron at Philadelphia. Continued selling of valley pig iron at Chicago at concessions has had a depressing effect on prices thereabout, while little business has developed in the south, and prices are fairly firm. Low prices on foundry grades are being quoted in the Pittsburg district. An encouraging development in merchant pipe is found in the placing of orders for stock by jobbers, as well as a contract calling for 20,000 tons of gas pipe for use in West Virginia fields. Sheet bars to the amount of 56,000 tons have been sold for export in Great Britain. The announcement that the Upson Nut Co. is planning to build an open hearth steel plant at Cleveland is a manifestation of the growing unwillingness of manufacturers to pay freight charges on semi-finished material from Pittsburg to their plants. The forest fires of the northwest have stimulated the demand for nails and other wire products to carry on rebuilding. The extreme drouth has had the effect of injuring the prospects of the canning industry, and of threatening to close coke plants in the Connellsville region.

CANADIAN GRAIN SHIPMENT.

F. E. Gibbs, government inspector and weighmaster at Fort William, has prepared the following statement showing shipments of grain from the different elevators at Fort William and Port Arthur for the crop year, Sept. 1, 1907, to Aug. 31, 1908, inclusive, with port of destination:

TESTIMONIAL TO CAPT. UBERROTH.

Capt. Preston H. Uberroth, commanding the United States revenue cutter Tuscarora, has received the following testimonial from the citizens of Grand Marais in appreciation of his activity in assisting them during the recent forest fires:

"We, the undersigned citizens of the village of Grand Marais, Cook county, Minnesota, hereby express to you our sincere gratitude for the assistance you have been to us and to the settlers outside of our village who have been driven from their homes to this village for protection during the prevalence of forest fires which have prevailed in Cook county during the past several weeks. Your presence here helped much to give assurance of safety and the provisions you left here for the destitute have already caused some who had lost heart entirely to take a new lease of life, and start in with a determination to win bread, food and shelter for their wives and children, who had their all swept away by the flames.

"Realizing that it is the purpose of government vessels to help those in distress on a bordering great lake, still we wish to especially thank the Tuscorora's commanding officer for his thoughtfulness in coming to us in this, our hour of great need.

"Fred Jackson, village president; T. I. Carter, county auditor; D. B. McAlpin, village trustee; Louis Engleson, village clerk; B. H. Luis, merchant; E. W. Wakelin; C. Backstrom, merchant; S. Zimmerman Jr.; Seymore Mitchell; Olaf Johnson; Noel Hamlin; Chas. Howenstein; Louis Falk; John A. Blackwell, publisher; C. G. Stritsland, village treasurer; Chas. J. Johnson, postmaster; John S. Sandin; John Johnson; John Woods, U. S. lighthouse keeper; Geo. H. Durfee, judge of probate court."

MULHOLLAND HATCH FASTENER.

The Mulholland hatch fastener has been adopted by the steamboat inspection service and has received the approval of the department of commerce and labor. Capt. Matthew Mulholland, of the Bradley fleet, brought out this device several years ago and has been successful in introducing it upon a great number of the leading steamers of the great lakes. It has also been adopted by the navy department and is meeting with approval wherever used.

During maneuvers conducted recently in Vineyard Sound by the cruiser Yankee and a submarine fleet the Yankee was anchored while the Cuttlefish, Viper, Tarantula and Octopus were sent off in different directions for several miles. They then slowly approached the cruiser, experimenting with different colors while the officers and crew of the Yankee took observations. The submarines approached the cruiser both in the sun's rays and in the opposite direction. The object of the test was to see if some color could not be found which would make it difficult for a warship's crew to observe a submarine.

	Wheat		Oats		Barley		Flax	
Canadian ports—	Canadian Vessels.	Foreign Vessels.	Canadian Vessels.	Foreign Vessels.	Canadian Vessels.	Foreign Vessels.	Canadian Vessels.	Foreign Vessels.
Owen Sound	1,661,159.10	.....	2,268,628.16	.....	233,542.36	.....	.....	.....
Midland	3,386,382.30	.....	34,493.24	.....	24,139.02	.....	.....	.....
Tiffin	1,357,126.10	.....	424,520.08	.....	77,420.22	.....	.....	.....
Collingwood	423,878.30	.....	40,415.20	.....	.....	.....	.....	.....
Depot Harbor	3,657,130.50	.....	272,962.22	.....	44,701.40	.....	.....	.....
Point Edward	1,866,762.50	.....	292,059.02	.....	47,867.04	.....	23,079.05	.....
Meaford	783,982.40	.....	232,884.30	.....	41,637.28	.....	.....	.....
Goderich	3,597,301.10	.....	1,337,909.16	.....	41,830.26	.....	301,072.54	.....
Port Colborne	291,063.00	.....	.....	.....	.....	.....	31,701.44	.....
Thorold	468,391.20	.....	.....	.....	.....	.....	.....	.....
Kingston	6,307,026.40	.....	548,213.26	.....	351,747.38	.....	171,574.05	.....
Prescott	576,964.40	.....	.....	.....	17,921.32	.....	.....	.....
Montreal	5,685,056.00	.....	824,155.12	.....	311,988.17	.....	560,496.01	.....
Total Canadian ports	30,242,225.30	.....	6,276,243.06	.....	1,193,617.45	.....	1,087,923.53	.....
Foreign ports—								
Port Huron	106,093.50	194,603.10	.....	6,334.02	.....	.....	.....	.....
Erie	300,181.00	519,144.10	.....	.....	.....	.....	.....	.....
Chicago	.....	183,383.00	.....	.....	.....	.....	.....	.....
Ogdensburg	63,042.50	.....	.....	.....	.....	.....	.....	.....
Buffalo	1,723,805.10	4,593,517.40	746,153.20	269,079.06	51,471.20	40,273.44	104,242.01	42,000
Total shipments	32,435,348.20	5,490,648.00	7,022,396.26	275,413.08	1,245,089.17	40,273.44	1,192,165.54	42,000

Comparative statement showing total shipments of grain from Fort William and Port Arthur of the crops of 1907, 1906, and 1905—Sept. 1 of each year to Aug. 31 of following year:

	Wheat.	Oats.	Barley.	Flax.	Rye.	Total.	
Totals—Crop 1907	47,521,490.50	11,096,405.24	1,971,938.41	1,514,644.40	3,036	62,107,516	Bushels
Totals—Crop 1906	54,849,649.40	12,744,736.02	1,839,177.42	753,307.26	9,010	70,195,881	Bushels
Totals—Crop 1905	55,509,720.50	5,721,815.30	959,546.42	456,928.16	.....	62,648,010	Bushels

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ATLANTIC COAST NOTES.

Office of the MARINE REVIEW,
Room 1005, No. 90 West St.,
New York City.

The Cunard liner Mauretania, which docked at New York on Saturday, reported that on Thursday, the 17th inst., while encountering unusually heavy weather, a blade was lost off the starboard low-pressure propeller. This was the only injury the big vessel suffered. Outgoing mail, with the exception of that specially marked for the Mauretania, will be carried on the White Star liner Oceanic, the Cunard steamer unavoidably being compelled to make the eastbound trip under reduced speed.

Three lightships and a like number of tenders steamed away from Tompkinsville, S. I., on Monday, on a long journey to the Pacific Coast. The course taken by the lighthouse department's small fleet will be practically the same as that of the torpedo flotilla which accompanied the battleship fleet to the Pacific, and the time taken will probably be about four months. Captains Barron, Roberts, and Bowman are in command of the tenders Manzanita, Columbia and Sequoia; Captains Phillips, Peterson and Wolcott being in command of the lightships Swiftsure, Kukui and Relief, respectively. The Manzanita, flagship, is bound for San Francisco; the Kukui for the Hawaiian islands and Sequoia for the engineering department on the coast. The lightships are for the Strait of Juan de Fuca, Columbia River bar, and one as a relief ship. The entire fleet was built by the New York Ship Building Co. at Camden.

Fire broke out on a barge loaded with bags of paraffine wax at the piers of the Cunard Line in New York, on Monday, for a time endangered the liners Slavonia and Etruria. The wax had been unloaded from the Etruria immediately previous to the oubreak of the fire, the origin of which is unknown. The fireboat New York, with the assistance of a tug, towed the barge with its blazing cargo out into the stream, where the fire was extinguished, the burned barge being later beached on Baxter's Flats.

By the arrival of the fruit steamers Brewster, from Boston, and Beacon, from Baltimore, at Port Antonio, all anxiety regarding the likelihood of the vessels failing to weather the storm which swept the vicinity in the past few days was past. Both steamers had suffered severely, the Beacon's fires being extinguished through the flooding of the boiler and engine rooms and the vessel being at the mercy of the storm for 48 hours. The Beacon reported having sighted a wrecked three-masted schooner at the east end of Bird Rock. There was no notice taken of the steamer's signals, the schooner apparently being deserted. Her name could not be distinguished, but she is believed to be the William J. Lermond, of Philadelphia, which sailed from that city on Aug. 22 with 1,200 tons of coal for the Jamaican government.

The Baxter Wrecking Co., of New York, has been awarded the contract to raise the tug J. S. W. Holton, sunk in the Delaware river off Edgemoor by collision with the steamer City of Chester.

The freight service of the White Star Line will be resumed between New York and Liverpool in the near future. The line discontinued the service in June on account of lack of freight, the steamers Bovic, Sevic, Georgic, Armenian and Victorian being affected.

The Taormina, the latest addition to the fleet of the Italia Societa di Navigazione a Vopore, arrived this week at Philadelphia to enter the company's service between that port and Italian ports. The Taormina is sister ship to the Ancona and Verona, has a speed of 17 knots and accommodation for 2,460 steerage passengers and 100 cabin. She is 432 ft. long, beam 58 ft., and is of 14,000 tons. On her trial trip she averaged 18.45 knots per hour, and was built on the Clyde by David & William Henderson. The dock of the Italian company at Philadelphia had to be dredged to accommodate the new liner.

The steamship Colon, of the Panama Steamship Company, arrived at Colon on the 18th inst., considerably damaged by heavy weather encountered on the voyage, and reporting the death of three members of the crew. The Colon left New York on the 10th, and encountered a hurricane at a point 40 miles north of Watling Island. During the storm one of the vessel's smokestacks was carried away, as were also three of the boats. The passenger and other quarters were flooded out. In investigating the source of a salt water leak in the fresh water tanks, one engineer, a water-tender and the ship's carpenter were smothered by poisonous gases in the hold.

The graduation exercises of the New York nautical schoolship Newport took place this week on board the ship at her anchorage in the East river, this being the first graduation on the Newport since replacing the old St. Mary's. The Maritime Exchange presented to the first and second honor graduates of the school prizes consisting of a sextant and pair of binoculars. The winner of the first prize this year is Dwight A. Smith, who, in company with other graduating members, has entered the lighthouse department service and is now on his way to the Pacific with the fleet which sailed from Tompkinsville. The graduating class this year numbers 38.

The British ship Timandra, bound for Boston from Buenos Ayres in ballast, according to a cablegram received in Boston on the 18th has put into Barbadoes with 10 ft. of her stem gone and leaking heavily. Her officers reported that she had been in collision with an unknown steamer in the vicinity of the equator on the night of Aug. 7, the bulkheads of the vessel alone having prevented her from sinking.

It is pointed out that as the steamer Lina, which, during the summer, ran between Cape May and Lewes, is now a complete wreck, and that her officers have had their licenses either suspended or revoked, there seems to be nothing left for the United States district attorney for Delaware, who has begun an investigation into the facts connected with the violation of the revised statutes by the officers aforementioned, to fight about.

Commissioner of Docks and Ferries Spooner, of New York, on Monday laid the cornerstone of the new municipal ferryhouse on South street, at the Battery, the operation being performed without formality in the presence of half a dozen officials and the workmen on the job. A copy of the record of the land acquirement, the pen used in executing the document, a history of the municipal ferry project, a few newspapers of date and coins of the present era were placed in a copper receptacle within the stone. The new structure, which is to be an exceptionally fine piece of work, will cover seven slips and cost $1,250,000.

The steamer Mineola has arrived at New York from Vancouver, by way of Punta Arenas, after circling the globe as the yacht of Col. R. M. Thompson, of New York. She sailed from New York last November, stopping at Gibraltar, Marseilles, Malta, Suez and other ports.

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NAVAL AND MERCHANT SHIP BUILDING IN JAPAN.

In last week's issue was published an article from *Engineering*. London, reviewing the progress of ship owning in Japan. *Engineering* later discussed the subject of ship building and naval work in Japan as follows:

Ship Building.—The three principal private ship yards in the country are Mitsu Bishi Dock Yard and Engine Works, at Nagasaki, with a branch at Kobe; the Kawasaki Dock Yard Co. at Kobe, and the Osaka Iron Works at Osaka. There are besides the Uraga Dock Yard Co., at Uraga, in Tokio Bay, and the Ishikawajima Ship Building Co., at Tokio. These have at certain periods shown signs of great activity, but have at present dropped somewhat out of the running, except for repair work, and for this purpose the former has two fine graving docks. In 1906 the Uraga Dock Co., however, built two torpedo boat destroyers for the Japanese government, and last year the Ishikawajima Works turned out three small steamers, the largest 917 tons gross. In the same connection the Yokohama Dock Yard Co., may be mentioned, a very enterprising and firmly established company, in possession of two good graving docks. Except small vessels, such as steam launches and motor boats, this company has not at present ventured upon new construction, although, with some developments, a larger policy. would seem to be well within its scope. Scattered throughout the country there were, in all, in 1906, 214 private ship yards, the largest number being in the Osaka district, 38; Hiroshima, 31; and Yamaguchi, 38. Most of these ship yards are engaged upon small craft, in many cases of junk build and rig only; but some undertake wooden steamers, and a few, though furnished with but few machines, consider the building of a steel ship by no means beyond them, the limit of size being, perhaps, 1,000 tons. The engines for these steamers are not very difficult to obtain. General engineering shops of small size are fairly plentiful throughout the country, and any one of these will undertake to build a marine engine when called upon to do so. In some cases the ship yard has a small machine shop in which to do its own work, obtaining only the castings outside; in others the obtaining of a satisfactory boiler is a matter of somewhat greater difficulty, and the ship yard builds its own boiler as well as hull, obtaining the engines only from outside. The special ship yards that may be mentioned in this connection are: Oaki's, at Shingawa, Tokio (which, however, builds only wooden vessels); Ono's and Fujinagata, at Osaka, and Chujio's, at Tosa.

The Mitsu Bishi Works at Nagasaki were purchased by the present possessors in 1884; they had been previously in the hands of the Imperial government, having been originally founded by the Shogun's government in 1857, for the repair of small vessels of war. The principal work done in the first three years after 1884 was an iron steamer of about 200 tons; then followed three steel steamers of about 700 tons each, and later, in 1895, the Suma Maru, of 1,530 gross tons, the largest steel merchant ship built in Japan up to that date. Following the ship building encouragement law in 1896 came Nagasaki's more modern development, the Hitachi Maru,* completed in 1898, being the first steamer exceeding 6,000 gross tons built in Japan. The launches each year since 1900 have been as follows:

	No.	Gross Tons.	Indicated Horsepower.
1900.....	6	3,307	5,411
1901.....	8	17,434	14,929
1902.....	5	14,032	11,878
1903.....	6	15,276	14,937
1904.....	3	10,691	9,775
1905.....	6	8,674	10,949
1906.....	10	12,653	40,460
1907.....	3	35,724	40,700

It is at these works that the steamers of the Nippon Yusen Kaisha, at least in recent years, have been largely built, as witness the Hitachi Maru, the Tango Maru, the Nikko Maru, and the Ceylon Maru, all already mentioned. The Tenyo Maru and the Chiyo Maru, built for the Toyo Kisen Kwaisha, and fitted with Parsons turbine machinery, are among the latest of the productions of the company; also the Mogami, dispatch vessel, built for the Japanese government, and furnished with Parsons turbines; the Sakura Maru, the first of two steamers for the Japanese Volunteer Fleet, similarly furnished. The extent of the works covers at the present time some 114 acres; they are well fitted with complete equipment for building hull, machinery and boilers, also with the special machines required for producing Parsons turbines, for the manufacture of which in Japan the Mitsu Bishi Co. holds the sole right. The Sakura Maru is the first steamer in which this right is being exercised, the machinery for the other steamers mentioned being obtained direct from the Parsons Marine Steam-Turbine Co., of Wallsend-on-Tyne.

*This steamer was torpedoed and sunk by the Russian battleship Rurik in June, 1904.

The works at Nagasaki are also admirably suited for repairs, possessing three graving docks, with a length on the keel-blocks of 350 ft., 510 ft., and 714 ft., respectively, and a hauling-up slip. A branch of the Mitsu Bishi Co. was started in 1903 at Kobe, on a scale that will allow of very great developments in the future; at present this branch is laid out principally for repairs. A floating dry dock was inaugurated here in 1905, the material for this dock being obtained from England, together with the design, but the construction in all its parts being performed at the works at Nagasaki; the lifting power of this dock is 7,000 tons. A second dock, for the same purpose, but with a lifting power of 12,000 tons, is at the present time under construction at the Kobe works.

The Kawasaki Dock Yard Co.'s works, also at Kobe, were originally started by the Imperial government some 35 years ago; in 1886 they were purchased from the government by S. Kawasaki, and in 1896 transferred to the present company. The name, indeed, is a coincidence, Kawasaki (= river cape) being the locality in Kobe where the works are situated, as well as the name of the family which for more than 20 years has been connected with it, Y. Kawasaki being the present vice president, under K. Matsukata, the president. The account of the output from these works is as follows:

	——Vessels——		No. of Men
Date.	Number.	Gross Tons.	Employed.
1897.....	3	771	1390
1898.....	7	302	1415
1899.....	18	1,852	1600
1900.....	8	4,219	1800
1901.....	15	6,847	2750
1902.....	3	1,948	3060
1903.....	8	3,889	3400
1904.....	9	6,185	3850
1905.....	9	2,919	5100
1906.....	11	7,707	7880
1907.....	4	19,274	8135

In these works the ships have been mostly of moderate (and even small) size; they have included a large number of gun boats for the Imperial government of China, and a steam yacht for the government of Siam. During the past year and more, however, two large steamers for the N. Y. K. have been under construction, each with a gross tonnage of some 8,700 tons, and three cargo-steamers of about 6,000 tons for the O. S. K.; the yard and shops are equipped for large work, and contain all the plant needed for the construction of hulls and machinery. There is also a very fine graving dock, 377 ft. long on the blocks, besides two hauling-up slips for repairs.

The Osaka Iron Works, including dock and ship building yard, were

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started in 1880 by E. H. Hunter, and have steadily progressed during the intervening years, the managing partner for some time past being Riotaro Hunter, son of the founder. They are spread over various parts of the engine and boiler shops, and a dry dock on the original site, some two miles from the river mouth, a dry dock nearer to the mouth, and the new ship yard at Sakurajima, on the shores of the recently made, and still unfinshed, harbor of Osaka. The output from these works during the past decade has been as follows:

	——Vessels——		Men
Date.	Number.	Gross Tons.	Employed.
1898.....	3	1,319	1860
1899.....	7	2,094	2160
1900.....	3	1,882	2200
1901.....	4	2,402	2950
1902.....	7	698	3365
1903.....	7	4,284	2850
1904.....	7	2,895	3050
1905.....	6	3,476	3332
1906.....	8	6,539	3644
1907.....	10	5,904	3282

Summarizing the total ship building output of the country from private ship yards for eight years past, and including sailing vessels above 100 tons, and practically all steamers, the following table may be given:

	——Vessels——	
Date.	Number.	Gross Tons.
1900.....	21	10,763
1901.....	39	31,771
1902.....	34	24,769
1903.....	47	29,591
1904.....	62	32,612
1905.....	127	32,858
1906.....	127	44,452
1907.....	135	73,632

The Imperial Navy.—From small beginnings in 1867 the Imperial navy has advanced to a notable position among the navies of the world. At the commencement of Meiji (1867) it consisted of 9 or 10 vessels, with displacements ranging from 200 to 1,000 tons, taken over from the Shogun's government. Nine years later some wooden gunboats were built at Yokosuka; and about the same time a central battery ironclad and two composite armoured corvettes were ordered from England. In 1885-6 the Katsuragi and Musashi, composite sloops of 1,476 tons displacement, were launched at Yokosuka, and in 1888 the Takao, a small cruiser of 1,774 tons, the first iron warship built in Japan. Three iron gunboats and one steel, each of 615 tons displacement, followed; they were built in Japan at various places, and were succeeded by the Yayeyama, a dispatch vessel of 1,600 tons displacement and 20 knots, launched at Yokosuka in 1889. Three notable vessels were built a little later—the Itsukushima and Matsushima in France, the Hashidate at Yokosuka. During the war with China the Matsushima was Admiral Ito's flagship; the news of her tragic loss on Arpil 30 last, off the Pescadores, with the roll of young cadets serving on board, several of them the sons of fathers whose names are familiar in connection with the Russian war, belongs to the only too painful incidents of naval history.

Just before entering on the war with China in 1894, Japan possessed the following ships in her Imperial navy:

Five small armoured ships (with displacement varying from 3,718 tons to 1,459 tons).

Eighteen (iron or steel) cruisers and gun vessels, the largest being the Matsushima class of 4,277 tons; the smallest, the Atago class, of 615 tons.

Fourteen (wood or composite) cruisers (1,760 tons to 320 tons).

Fifty-eight torpedo boats (of which 17 were in course of construction).

Again, just before entering on the war with Russia in 1904, she had

Six large battleships (15,200 tons to 12,000 tons) and one small (the Chin Yen), 7,400 tons.

Six large armoured cruisers (9,750 tons) and one small (Chiyoda) and one coast-defence ship (Hei Yen). (The Nisshin and Kasuga—7,700 tons —were added to these in the early days of the war.)

Thirty-one cruisers and gun-vessels (with displacements varying from 5,416—the Kasagi—to 615 tons—the Atago.

Nineteen torpedo boat destroyers.

Eighteen torpedo boats—first class.

Fifty-five smaller torpedo boats.

Now the Imperial navy is made up as follows:

Fifteen battleships (displacement varying from 19,800 to 7,400 tons; aggregate, 207,916 tons).

Fourteen armoured cruisers (14,600 to 2,450 tons; aggregate, 140,061 tons).

Two coast-defence vessels (aggregate displacement, 9,086 tons).

Thirty-two cruisers and gun vessels (aggregate displacement, 83,846 tons).

Fifty-five torpedo boat destroyers.

Sixty-eight torpedo boats.

Seven submarines.

This list includes the ships captured from Russia both at Port Arthur and in the Battle of the Sea of Japan, numbering:

Six battleships.

Two coast defence vessels.

One armoured cruiser.

Three protected cruisers.

Two gun vessels.

In addition to the above, it is well understood, two battleships are at present in course of preparation, each having a displacement of fully 20,000 tons. No detailed information, however, is yet available as to their particulars.

The Imperial Dockyards.—The Imperial dock yards are four in number, and are situated at Yokosuka, Kure, Sasebo, and Maizuru; at pressent new construction is carried out principally at the first two, and of these Yokosuka stands in an inlet in the Bay of Tokio, some 10 miles from Yokohama, and Kure, in the Inland Sea. In both of these dockyards there are signs that the increasing dimensions of warships are taxing the capacities of the accommodation rather severely; the soft sandstone of which the high ground is composed has already been cut into in various directions, sometimes to make room for additional buildings, sometimes to form a tunnel connecting outlying parts with the main ground; but this method of extension evidently has its limits. The other Imperial dockyards have greater potentialities in the matter of the space they command; of these, Sasebo is located in the southern island of Kyushu, on its western side, a very large inlet from the sea forms here a magnificent harbor, and it is along the shores of this that the dock yard is spread. In one of the extensions at present in progress three new graving docks are under construction, having lengths of 750 ft., 600 ft., and 475 ft., respectively. Maizuru is situated on the Japan Sea side of the main island; it is the newest of the existing Imperial establishments, dating its first operative establishment from some four years ago. At first contrived principally for repairs, it is now being extended in directions suggestive of a very important future.

The output of tonnage from the Imperial dock yards during the past eight years has shown great variation from year to year. The amount launched per year is as follows:

Date.	Number.	Displacement.	Indicated Horsepower.
1900....	10	2,221	14,200
1901....	9	792	12,450
1902....	10	8,103	38,675
1903....	13	5,650	54,800
1904....	2	304	8,400
1905....	7	2,800	4,200
1906....	9	49,280	93,000
1907....	4	53,100	88,500

The Most Modern Ships.—It may be worth drawing attention once more to the prominent ships recently built or now building in the country, dealing alike with warships and with mercantile vessels. They are as follows:

Battleship Aki (19,800 tons), with Curtis turbine machinery.

Battleship Satsuma (19,200 tons), with reciprocating machinery.

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Armoured cruiser Ibuki (14,600 tons), with Curtis turbine machinery.

Armoured cruiser Kurama (14,600 tons), with reciprocating machinery.

Armoured cruisers Tsukuba and Ikoma (each 13,750 tons), with reciprocating machinery.

Dispatch vessel Mogami (1,350 tons), with Parsons turbine machinery.

All the above are fitted with the Miyabara water tube boilers.

Tenyo Maru and Chiyo Maru (each 13,500 tons), and one other not yet named (13,700 tons), with Parsons turbine machinery, for the service of the Toyo Kisen Kwaisha, between Japan and America.

Six steamers Kamo Maru, Mishima Maru, and others (each about 8,700 tons), for the European service of the N. Y. K.

Six steamers (each about 6,000 tons), for the Osaka Shosen Kwaisha.

Two steamers (each about 9,300 tons), for the Toyo Kisen Kwaisha, oil-tank steamers for importing American crude oil.

Sakura Maru and one other steamer (each about 3,700 tons), with Parsons turbine machinery, for the Japanese volunteer fleet.

Subsidies to Shipping and Ship Building.—The first law for the purpose of assisting the building and owning of ships in "foreign" style was passed in 1870. The law which is at present in force was passed in 1896, and is to expire in 1914. In its relation to ship owning, provision is made for a payment of 25 sen (6d) per gross ton per 1,000 miles, to ships under the Japanese flag, engaged in foreign trade, of not less than 1,000 tons (gross) and 10 knots speed. The amount of payment varies with size and speed, reaching a maximum of 60 sen per ton for ships of not less than 6,000 tons (gross) and 17 knots. The amount also varies with the age of steamers, the full sum being due for the first five years after launching; it is then reduced 5 per cent per year up to the fifteenth year, when it is entirely withdrawn. Ships taking advantage of this provision are granted a certificate called the "Navigation Encouragement Certificate." For competition with foreign companies the encouragement thus provided proved insufficient, and in 1899 a very important new departure was made. Special contracts were entered into with various Japanese steamship companies to run regular services on certain definite routes. The routes and companies obtaining the advantage of these subsidies are the European, Seattle and Australian lines of the Nippon Yusen Kwaisha, the San Francisco line of the Toyo Kisen Kwaisha, the more local lines of the Osaka Shosen Kwaisha, and two or three other less well known companies. For the European line the contract calls for 12 vessels, each of 6,000 tons gross and 14 knots speed; for the Seattle line three vessels, each of 6,000 tons and 15 knots; for the Australian line three vessels of 3,500 tons and 16 knots; for the San Francisco line three vessels of 6,000 tons and 17 knots. The number of steamers possessing the Navigation Encouragement Certificate in March, 1907, was 32, of an aggregate tonnage of 105,000 tons. The ownership of these steamers was divided as follows:

Nippon Yusen Kwaisha, 14, of 60,530 tons.

Mitsui Bussan Gomei Kwaisha, eight, of 25,114 tons.

Osaka Shosen Kawaisha, six, of 10,405 tons.

Mitsui Bishi Goshi Kwaisha, two, of 5,576 tons.

Government railways, two, of 3,359 tons.

The payment under this head was 961,779 yen in 1907-8, estimated to be increased to 3,483,955 yen in 1908-9.

The number of steamers owned by the six subsidized companies under contract to carry out the above-noted services were (early in 1907):

	Number.	Gross Tons.
Nippon Yusen Kwaisha....	78	253,363
Toyo Kisen Kwaisha.....	6	35,279
Osaka Shosen Kwaisha.....	100	110,741
*Konan Kisen Kwaisha....	3	3,329
*Daito Kisen Kwaisha.....	15	384
Oya Shosen Kwaisha.....	2	3,215

*Later in 1907 the Konan Kisen Kwaisha and Daito Kisen Kwaisha became absorbed into the combination referred to in our former article, the Nisshin Kisen K. K.

The amount of subsidies paid in this connection was 6,756,763 yen in 1907-8, and is estimated to be 6,886,300 yen in 1908-9.

In its relation to ship building the law of 1896 provided for a payment on both hull and machinery: For the hull, when the gross tonnage is between 700 tons and 1,000 tons the rate is 12 yen, and when the gross tonnage is above 1,000 tons the rate is 20 yen per ton; for the machinery the rate is 5 yen per I. H. P. actually developed upon trial, no payment, however, being made for machinery unless the tonnage exceeds 700, and the hull thereby entitled to its share. Steamers claiming these subsidies must necessarily be constructed in Japan; they must, moreover, comply with the ship building regulations of the Japanese marine bureau. Up to March, 1907, 67 steamers, of an aggregate gross tonnage of 138,900 tons, had been built to take advantage of this law. Sixteen of these vessels, with an aggregate gross tonnage of 65,436, belong to the N. Y. K., and 21, with an aggregate gross tonnage of 27,572, to the O. S. K. The payment under this head was 677,348 yen in 1907-8, and is estimated to be 1,995,440 yen in 1908-9.

Steel Making in Japan.—The only steel works in the country for the manufacture of mild-steel ship building material are the government works, situated near Wakamatsu, in the southern island of Kyushu. Whether the new establishment now being developed in the northern island, the Hokkaido (at Mororan), by the joint action of the Armstrong firm, the Vickers firm, and Hokkaido Tanko Kisen K. K., will be available for similar purposes, belongs perhaps, to the undetermined events of the future; but in any case the present consumer has only the one source of supply without going to Europe or America. The government steel foundry, as it is termed, has been doing work since 1901, increasing both in volume and in utility. During the late war its produced material was all requisitioned for military purposes, but at present both the imperial navy department and private firms participate in the advantage of getting the steel material they require without sending for it from abroad. In the case of some of the large vessels building at the imperial dock yards of Kure and Yokosuka it is said that nearly all the material in their construction has been obtained within the country; and private ship builders are certainly also getting a share of the output of the steel made at Wakamatsu. The plant comprises 12 Siemens furnaces of two sizes (25 tons the smaller), and four Bessemer converters. The four larger Siemens furnaces and two of the Bessemer converters are new; before they were brought into working order the output in any one year had been 100,000 tons, a large proportion being rails; with the enlarged plant an output of 270,000 tons is anticipated, one-third of which will be hard steel, and the remainder available for structural purposes, that used in the ship yard forming a large proportion.

Cast steel, within certain limits, is produced more generally than plates, angles, etc. Both at Yokosuka and at Kure plant exists for the purpose, and the heavy castings for warships are made at both these establishments; indeed, Kure, with its gun

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factory, is capable of making castings of any required weight and intricacy. In several private works steel making for castings is also effected, and at least one work has been established for the supply of anchors and other castings of moderate weight.

Conclusion. — From the foregoing notes it will be clear that, for the present at least, Japan is committed to a distinctly forward policy, both in her ship owning and in her ship building. How keenly she is interested in the latter is attested, among other signs, by the number of students at present under training in this subject at the Imperial University of Tokio. Spread over a three years' course, these now number 115; five of them are navy students, training as imperial naval constructors; the remainder are students of mercantile ship building. The age of these students at commencing is about 21 years, at finishing 24; and the course of study aims at qualifying them so that any problem that the future may bring may be within their grasp. The practical part of their training is undoubtedly insufficient, but is good so far as it goes; in the case of the most capable and energetic men, it is supplemented, in the early days of their ship yard employment, by the nature of the work they are given to do. The more ordinary drawing-office work and oversight in the ship yard falls to other (non-varsity) men whose practical knowledge is supplemented by a course of training in one (of several) technical schools or colleges, or in a special school for apprentices and foremen.

The present expenditure on the navy is part of the nation's policy, calling forth vehement criticism among the mercantile community at home, and the nation's critics both at home and abroad. The encouragement given to shipping and ship building is generally acquiesced in, as essential to development. The number of years required before these can be self-supporting, and independent of subsidy, can scarcely be estimated; the future alone can decide.

PREPARING TO BUILD A STEEL PLANT.

The Upson Nut Co., Cleveland, owner of the Upson nut and bolt works, and a blast furnace on the Cuyahoga river, is about to receive proposals for the building of a steel plant and bar mill on a site near the other two plants. Estimates are soon to be submitted for three open-hearth furnaces, a 34-inch blooming mill and a finishing mill. Hot metal can easily be taken from the blast furnace to the steel plant. The Upson Nut Co. uses a considerable tonnage of steel bars, and, if so disposed, could doubtless sell a large amount to other consumers in Cleveland and vicinity.

AROUND THE GREAT LAKES.

Considerable trouble has been caused the dredges at the mouth of the Detroit river by downbound boats passing Detroit river lighthouse on the east side instead of going to westward, as the regulations provide. Col. Townsend, government engineer, has accordingly ordered all downbound boats to pass to the westward of the light. The upbound boats will continue to use the east channel.

The old Northwestern railroad bridge across the Chicago river was removed Sunday morning, temporarily suspending traffic. It will be replaced by a double track, single leaf bridge of the Strauss trunnion bascule type with a 170-ft. span.

John H. Burton, dock superintendent at Ashtabula, is suffering from two broken ribs sustained in an automobile accident.

The steamer Melvin S. Bacon while loading coal at the Irishtown dock, Cleveland, was struck by the steamer W. H. Mack. It was necessary to put extra pumps aboard to keep the water down.

The steamer W. G. Pollock, which was in collision with the steamer North Star last week, has about 20 damaged plates.

The strike which has tied up the tugs at Buffalo harbor during the past few days has been settled. President D. J. Keefe, of the Longshoremen's Association, and President T. V. O'Connor, of the Licensed Tugmen's Protective Association, met with Capt. Louis Lautenslager, Buffalo manager of the Great Lakes Towing Co., and entered into an agreement for two years. Both sides are satisfied and it is not likely that there will be any further trouble. While it lasted, however, it was very inconvenient to the dock companies, as a number of the ore carriers could not reach their docks.

In the thick smoke prevailing, the steamer Harvey D. Goulder went on Fighting Island, Detroit river. She was released by the tug Harding and proceeded on her way uninjured.

The steamer Sonora, which went ashore about 18 miles north of Harbor Beach, was found upon examination to be out 18 in., and the wrecking steamer Favorite was ordered to her to lighten her cargo of ore.

The directors of the American Ship Building Co. have declared the regular quarterly dividend of 1¾ per cent on the preferred stock, payable Oct. 15.

The directors of the Great Lakes Towing Co. have declared the regular quarterly dividend of 1¾ per cent on the preferred stock, payable Oct. 1.

The Portage Transit Co., owner of the steamer Portage, the lumber carrier which was burned to the water's edge at Marquette in September, 1907, has begun suit in the circuit court at Detroit against seven insurance companies to collect policies aggregating $25,800. The repair bill on the Portage was so large that the owners claim a total loss, while the insurance companies stand out for partial loss. The repair bill was more than $20,000.

BARGE CANAL CONTRACTS.

Plans have recently been approved by F. C. Stevens, state superintendent of public works, for about $4,000,000 of additional work on the New York state barge canal and the bids will be advertised for shortly. The work will be carried through under three separate projects, as follows: No. 46, for excavating the new canal for 9½ miles, from Foxridge to Galen, Wayne county, at an estimated cost of $1,360,000; No. 47, for excavating from Galen to Lyons, 14½ miles, at a cost of $1,430,000; No. 68, for locks in the Champlain canal in the Hudson river at Mechanicsville, Stillwater and Northumberland, and for 1½ miles of excavation, all at an estimated cost of $1,175,000.

A lady was travelling by boat from Leith to London, and it was the first time she had ever journeyed so far by sea. She reached her destination, says the *Shipping Gazette*, jaded and tired out. Her hostess remarked that she looked fatigued. "Yes," said the voyager, "I am just tired to death. I don't know that I care to travel by water again. I read the notice in my cabin about how to put the lifebelt on, and I thought I understood it. I suppose I didn't, though. Some way or other I could not get a wink of sleep with the thing on, and I was afraid to take it off."

The Cunard line steamship Lusitania was prevented recently from making what would perhaps have been another record breaking voyage across the Atlantic by the blowing out of a boiler fuse which necessitated completing the passage on reduced speed. Every preparation had been made for a record trip.

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INFLUENCE OF ASH AND SULPHUR UPON BOILER EFFICIENCY.

In a recent paper E. G. Bailey, chief of the coal department, Arthur D. Little's laboratory, Boston, points out the influence of ash in coal upon boiler efficiency and shows that it depends not altogether upon the amount of ash, but also upon the nature of it. "Ash from certain coals," he says, "has a very high fusing temperature. It is almost impossible to make any large clinker from it, no matter how much fire you have, while other coals at a comparatively low temperature (the fire not being forced) will give a very bad clinker. This has frequently been blamed on the sulphur. The sulphur itself should not take the blame, because it is a question of the fusibility of the ash. Tar will melt at one temperature, pitch at another, lead at another, and iron at another, depending upon the fusing points of those different compounds or elements. Ash in coal is a good deal the same. It is composed of practically the same things as clay. You take an ordinary paving brick and line your furnace with it, and it doesn't last very long, but the best of fire clay will withstand a very intense heat. The ash in coal can be compared almost directly to the clay of which brick is made. Some of it contains considerable iron and other fluxes, which cause it to melt at a very low temperature and gives a great deal of trouble in burning grates, stopping the air supply, necessitating frequent cleaning of the fire, which condition cannot help but result in a lower boiler efficiency. Every time you clean the fire you lose several per cent. Your boiler is cooled and in order to obtain the previous furnace conditions, several hundred pounds of coal are required. Also, with a higher ash, whether clinking or not, the fire must be cleaned more frequently, and the percentage of loss in the coke that drops through your grate is larger in proportion to the working of the fire and the number of times that it is cleaned. Mr. Abbott made some tests not long ago in which he showed with the same coal that as the ash was increased to 40 per cent, the boiler efficiency was reduced to zero. The United States geological survey made some tests at St. Louis, in which they burned some of the refuse resulting from the washing of coal. I do not have the exact figures at hand, but the ash in that refuse ran 50 odd per cent, and the boiler efficiency obtained was above 40 per cent.

"Sulphur in coal is detrimental for two reasons. It is generally combined with iron, and the iron causes the clinker. The sulphur also, being liberated as the coal is burned, undoubtedly has some effect on the boiler tubes, the stack (if an iron stack is used) and the other iron work, but just to what extent this occurs I have no specific data. In a case to my knowledge, where horizontal return tubular boilers are used at mines which produce coal varying from 0.9 to 4.00 sulphur, there was no practical difference noted in the condition of the boilers. In another case, where low sulphur coal was burned, an analysis of soot and other accumulation on the outside of the tubes of a Babcock & Wilcox boiler showed nearly 25 per cent of free sulphuric acid, and sulphates of iron, showing that the tubes had been attacked more or less by the sulphur."

QUESTIONS FOR MASTERS AND MATES.—NO. 13.

190. What kind of liquid in a Baker compass?

191. What is the system of reading the compass by degrees?

192. What is the meridian of the compass? Why?

193. How does NE by E derive its name?

194. Your compass course is NE with the wind north, and you are making ¼-pt. leeway? What course should you steer to counteract the effects of the leeway?

195. Owing to stress of weather you are forced to run into the wind and sea. Your course by compass is WNW, and you have run on this course for 16 hours, making 7 miles per hour; the Var. at start is 2½° Ely, and at end 5° Ely, and the Dev. for WNW is ⅜-pt. Ely, what is the true course you have made good and how would you find your position on the chart?

196. You have an old chart dated 1898, which gives the Var. at a certain place as being 3° 15′ Wly, and the annual change is 5′, what is the Var. for 1906?

197. Heading on Frying Pan and Pipe Islands range, your compass says N⅝E, how much and which way is the deviation?

198. When a patent log indicates more miles than the ship has run, what might be the trouble with it?

199. What influences affect the log mostly?

200. With a following sea will your log underrate or will it overrate?

201. You are steering SW, Var. 6° Wly when north star bears due north by same compass, how much and which way is the deviation?

202. The circumference of the earth at the equator is, in round numbers, 25,000 statute miles. The earth "turns" this off in 24 hours. The parallel of 60 degrees is just one-half of the circle of the equator. At what rate of speed does the earth turn on the parallel of 60 degrees? Why should it not turn as rapidly as on the equator?

203. Does the sun rise and set north or south of true east and west this season of the year?

204. If it were possible for an observer to be situated directly over the true north pole in mid-summer, what would be the true bearings of the sun at any time?

ANSWERS TO QUESTIONS FOR MASTERS AND MATES. NO. 13.

190. Benzine—refined petroleum.

191. Reading from north and south toward east and west 90 degrees.

192. The N and S line on the card. These points on the card are in imagination presumed to coincide with a meridian on the earth's surface, and would were it not for the variation of the compass. All direction is based upon the meridian of the earth and north and south on the compass card is made to coincide with it by making the proper allowances for variation and deviation.

193. Because it is *by* and 1 point east of NE.

194. NE ¼ N.

195. Compass course WNW, mean Var. ⅜-pt., Dev. ⅜-pt. Ely. Total correction ¾-pt. Ely. True course made good NW x W ¼ W. Lay off this true course from point of departure and measure off the distance, 112 miles.

196. 3° 55′ Wly.

197. True bearing N ⅜ W, Var. ⅜ Wly. Correct magnetic bearing N. Dev, on N is ⅝ Wly.

198. Blades of rotator may have too much pitch, might have got bent. Might be too close to current from wheel, or the log line may be too short.

199. Head or following sea, current, bad steering or improper length of line.

200. Under-rate.

201. 6 degrees Wly.

202. In round numbers 12,500 miles in 24 hours. As the parallel of 60 degrees is just one half of the circle of the equator it has only half as far to travel in the same length of time—one revolution. 520.8 miles per hour.

203. South—October.

204. At the north pole there is only one direction, south.

The Seaford Ship Building & Marine Ry. Co., Seaford, Del., have begun operations on their new pier and railway foundation.

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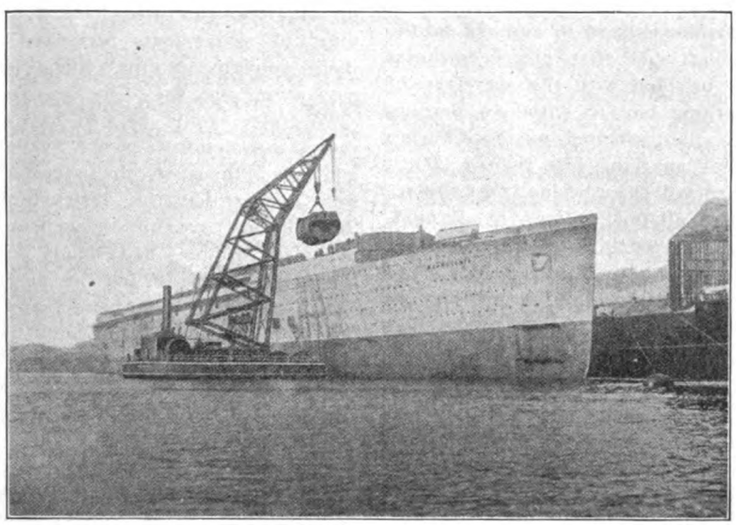
SHIP YARD FLOATING CRANES.

During the past decade great strides have been made in the design and application of ship yard facilities for the construction of large vessels. At the ship building exhibition being held in Berlin there are many models showing German designs. Amongst these to which attention should be drawn is the large exhibit of Messrs. Bechem & Keetman, Duisburger Machine Works, Duisburg on Rhein.

This company has specialized in cranes for ship yards and docks, which they have supplied to all the principal ship yards in Germany. They have also supplied their specialties to ship yards in this country. The enormous floating crane, shown in the above illustration, was designed and constructed by them to the order of



FLOATING CRANES AT SWAN & HUNTER'S YARD.

Messrs. Swan, Hunter & Wigham Richardson, Wallsend-on-Tyne, and was specially built for putting the large boilers on board the Mauretania. A capacity of 140 tons was at the time considered a high one, and such a great capacity had not previously been required for a floating crane. It should be pointed out that a serious restriction as regards the structure of the crane was imposed upon Messrs. Bechem & Keetman on account of the bridge situated near Elswick-on-Tyne. The lower flange of the bridge is in spring tide about 90 ft. above the surface of water. The crane when erected has a height of 130 ft., and consequently a lowering arrangement had to be provided so that the crane could pass underneath the bridge.

The jib swings round the two forefoot points, and is adjusted by means of two spindles made of Siemens-Martin steel. Water ballast serves as the counterweight. The water is placed in two water-tight compartments of the pontoon; the large boiler for the engine serves also as counterweight.

The rectangular pontoon is of 90 ft. by 80 ft. and has a height of 14 ft. The corners are rounded. When 140 tons are on board and the full load is suspended on the hook, the draught is about 8 ft. and the inclination 6 degrees. Two longitudinal and two cross partitions divide the interior of the pontoon into nine compartments. The four engines are placed in the center room underneath the crane structure. Loads can be transported on the foredeck by means of several truck cars running on rails. Four steam capstans are arranged in the corners of the pontoon, which serve for hauling purposes, and steam winches are also provided for the anchors.

The crane is fitted with three hooks, i. e., one each of 140, 20, and 5 tons capacity. The gearings for the various blocks are placed on deck underneath the crane structure. The large winch for the load of 140 tons has a double-rope drum, and is driven by a steam engine of 120 horsepower, with a cylinder 11 in. diameter and 18 in. stroke. This engine sets also the 20-ton winch in motion, and also the spindles for derricking the crane jib. Both drums for the large winch are built similarly; each one has a diameter of 51 in. and a length of 105 in., and is of steel with sides 1¾ in. thick. The drums run loosely on axles of 6 in. diameter. All spur wheels are made of steel. The drum for the 20-ton winch has the same length, and is built similarly to the large drums, but its diameter is 33 in. A special steam twin-engine serves for setting the 5-ton winch in motion, and is of 40 H. P. cylinder, 7 in. diameter, and 10 in. stroke. This winch has two drums, one for taking up the lifting rope and the other to take up the traveling rope which sets the trolley in motion running along the lower flange of the upper part of the jib.

The following speeds are attained:

Lifting a load of 140 tons at the hook for 140 tons about 4 ft. per minute.
Lifting a load of 70 tons at the hook for 140 tons about 8 ft. per minute.
Lifting a load of 20 tons at the hook for 20 tons about 25 ft. per minute.
Lifting a load of 10 tons at the hook for 20 tons about 50 ft. per minute.
Lifting a load of 5 tons at the hook for 5 tons about 60 ft. per minute.

PERSONAL.

Capt. John Bermingham, supervising inspector, U. S. Steamboat Inspection Service, is temporarily in charge of the local office at Seattle, during the absence of Inspectors Whitney and Turner, on their vacation. Capt. Bermingham's home office is at San Francisco.

Capt. Charles Scoville, who has for the past 19 years been engineer of the swing bridge at Ashtabula, has resigned. He has been identified with lake trade all his life, beginning as oiler on the steamer Hendrick Hudson in 1853. He later served as chief engineer on a number of lake steamers.

Reapei Kondi, president of the Nippon Yusen Kaisha (Japan Mail Steamship Co.) and Capt. T. H. James, London agent, arrived at Vancouver, B. C., on the S. S. Aki Maru, Sept. 15. Mr. Kondi is visiting the United States to confer with local officials regarding the establishment of new freight rates to the orient made necessary by the ruling of the interstate commerce commission requiring that the land portion through oriental rates be made public.

Theodore T. Mersereau, lately local inspector of steam boilers at the port of New York, and member of the American Society of Steam Engineers, Marine Engineers' Beneficial Association and National Association of Steam Engineers, has acquired the business formerly conducted by the late Thomas H. Barrett, at 80 Broad street, New York, and will give his attention largely to conducting the school which was founded by Mr. Barrett in 1904 for marine and stationary engineers who are desirous of improving their positions. The work will be conducted either by individual instruction at the school or by correspondence, as best suits the pupil. Rates for instruction are to be moderate.

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Chicago River Improvement Controversy.

The Lumbermen's Association of Chicago has written a letter to the vessel interests of the great lakes generally urging their co-operation for widening and deepening the Chicago river. The text of this letter is as follows:

"We understand through some of the members of your association that you are interested in improving channels for vessels at all ports around the lakes, and that you would actively take a hand in a matter of this kind, and it is for this reason that we are now writing you in connection with the matter.

"You are probably aware that the Lumbermen's Association is leading in a movement to get the Chicago river improved, widened, deepened and all obstructions to navigation removed for the good of the general navigable interests of the great lakes.

"We are having more or less controversy with the government engineer, the city engineer and the sanitary district trustees as to the proper construction of bridges over the Chicago river. As the flow of water is fixed by law, 20,000 cu. ft. per minute for each 100,000 of population, and limited by the government to one and one-quarter miles per hour, our contention is that we should have a full, unobstructed channel of 200 ft., all center pier bridges removed, all the bends and crooks in the river taken out, a 200-ft. clear span given at bridge draws, no 20 or 30-ft. abutments built out into the river at bridge draws.

"The government engineer here contends that notwithstanding the flow of water in the river that these obstructions in the river are not dangerous to navigation, and that large lake craft can come into the river without hindrance or interference through the narrow bridge draws and with the river in the shape it is in, and for that reason there is no necessity for putting in any larger draws than those prescribed by the sanitary district and permitted under the government regulations.

"We would like your opinion as to whether or not it is necessary on a stream 200 ft. wide, with a current such as we have in the Chicago river, to have the river as wide at the bridge draws as it is in other places of the river, taking into consideration tonnage of the modern class, such as you own, using the river?

"The Chicago river is spasmodically 200 ft. wide, but at the bridge draws is narrowed down to 100 to 140 ft., with the abutments sticking out into the river and no by-passes under the abutments. Between Madison and Van Buren streets the river is only 90 ft. wide, with a by-pass on the left side.

"Do your large boats come to Chicago and use the river in its present condition? If not, the reason why they do not come here.

"We believe in the construction of bridges and improvement of the river in such a manner as will permit the large modern navigable boats to come into the Chicago river.

"While this is a local matter, yet we believe that all navigable interests should take a hand in and aid in the movement, and that proper protests should be filed with the secretary of war, urging him to withdraw permits on the main channel of the Chicago river for anything less than a 200-ft. unobstructed span bridge, also the removal of all obstructions so all modern tonnage would have easy access to our river.

"The engineers, even though they be government engineers, are sometimes wrong in their opinions. An engineer originally estimated the cost of the drainage canal at from 15 to 17 million dollars and it cost 56 million dollars.

"We have known of government engineers who thought it was not feasible or practical to put a port on the Gulf of Mexico at Gulfport, Miss., yet Capt. Jones, of Buffalo, not only constructed a harbor, but dug a channel to the deep water in the Gulf of Mexico, and has had vessels as high as 100 in number, drawing 25 and 26 ft. of water in his port so that a government engineer making a statement which he believes a fact does not always make it so.

"While we do not desire to depreciate the opinion of government engineers, we simply desire to show that they are sometimes mistaken as well as the ordinary layman. Therefore, we believe that the practical experience of vessel men and captains on the river is just as valuable as an engineer's theoretical opinion as to the necessities and requirements of navigation of today, to say nothing of looking 10 to 25 years ahead.

"To show the necessity of an unobstructed channel, taking the flow of water required by law into consideration, we ask the engineers how two boats like the steamer Fred G. Hartwell, 504 ft. long and 58 feet beam, and the steamer Samuel Mather, 513 ft. long and 60 ft. beam, or the steamer Wilpen, 554 ft. long and 58 ft. beam and the steamer Wm. H. Wolff, 524 ft. long and 54 ft. beam, (the latter is owned by D. Sullivan & Co.) could pass each other through any 140-ft. span bridge on the river or go through Collision Bend near Eighteenth street, or through the Bend at State street or how any single boat like the above could go through the Pennsylvania Narrows between Madison and Van Buren streets, or through any of the center pier bridges or any of the new bascule bridges like Dearborn street or Van Buren street?

"We would therefore be pleased to have you write us fully regarding this matter, and also have the captains of your boats write us fully their opinions of the difficulties of navigation on the Chicago river.

"We also would like to have your vessel associations pass resolutions and send them to the secretary of war, urging that the obstructions in the Chicago be removed, such as center pier bridges, bad bends in the river and abutments put out at bridge draws narrowing the channel, and urging that the channel be unobstructed the full 200 ft. width at bridge draws, and that the Pennsylvania Narrows be removed, all of these being obstructions to navigation.

"If your association and interests individually take this up vigorously and aid us in the matter we can succeed in getting improvements in the Chicago river which are very much needed and which would be very beneficial to all navigable interests.

"Yours very truly,

"EDWARD HINES LUMBER CO."

In reply to this appeal G. A. Tomlinson, vessel owner of Duluth, wrote as follows:

"Duluth, Minn., Sept. 7, 1908.—Dear Sir:—The companies operated by me own 17 steamers, as follows: Sultana, 3,914 gross tons; Sonoma, 4,539; Sylvania, 6,272; Sonora, 3,914; Sinaloa, 4,539; Socapa, 6,372; Yosemite, 3,879; Saxona, 4,716; Hoover & Mason, 5,841; Sahara, 5,875; Ball Bros., 5,733; F. C. Ball, 6,909; Davidson, 6,206; Sierra, 4,846; Hartwell, 6,223; Berwind, 6,634; William Livingstone, 6,634.

"They are plying on the great lakes at every port easy of access and where they can be handled in and out of port at reasonable rates and where there is no loss on account of such

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operation on the tonnage or towage bills and where such operation does not cost us the expense of repairing damages, rubbing up against other boats, etc.

CALLS MOUTH TOO NARROW.

"To start out with, your Chicago river at its very mouth, will not permit the entrance of any of our vessels. At Rush street you have a center pier bridge and between Rush and Dearborn streets you have a bend in the river that none of our boats can enter on account of the narrow channel bridge at State street. At Dearborn street your channel is narrowed with abutments sticking out into river, so that if a boat could get in this bridge no other boat could pass it. These obstructions follow along from bridge to bridge, and the bends and crooks in the river make it absolutely prohibitory for our class of boats to navigate or operate on the river at all.

"Chicago has lost much of her prestige as a lake port because of the failure of its officials to improve the navigable stream so that it can be used for up-to-date modern steamships.

"There is no question if Chicago desires to retain what commerce she has left that the center pier bridges, bends in the river and bridges with abutments in the river must be removed, particularly so when the current in the river must be taken into consideration. Yours very truly,

"G. A. TOMLINSON."

The one most active in the campaign for widening and straightening the river is C. F. Wiehe, secretary of the Lumbermen's Association of Chicago. He recently wrote a long letter to Col. W. H. Bixby, government engineer, with whose position concerning the uses of the river he disagrees.

The whole situation concerning the Chicago waterfront appears complicated in that there seems to be a lack of concerted action. About a year ago the park commissioners had secured legislative action transferring to them the outer waterfront for park purposes, when commercial organizations stepped in and protested to the secretary of war against the use of the outer harbor for park purposes exclusively. In this they received the support of Col. Bixby, the government engineer. In a report presented to the chief of engineers on May 22, 1906, Col. Bixby points out that the Chicago river is expected to perform three entirely different functions; first, service as a sewer to carry water freely; second, service as the main wharfage area or principal dock of Chicago harbor, and third, service as a canal for the free passage of boats from one end of the harbor to the other. He contends that even after its enlargement to 200 ft. width and 26 ft. depth it will have all that it can do to properly fulfill either one of these functions, and that it cannot reasonably be expected to properly fulfill any two of them. He therefore advocates the improvement of the outer harbor for commercial purposes and for that reason strenuously objects to its appropriation for park purposes by the park commission. Moreover, he believes that the straightening and widening of the river would be very costly.

Mr. Wiehe in a recent interview in Chicago concerning the inadequacy of the Chicago river for modern vessels stated:

"There are 350 modern vessels which cannot even enter the harbor," continued Mr. Wiehe. "The lumber interests alone represent an annual trade of $150,000,000. The coal industry suffers by the fact that the big coal boats cannot come to Chicago. This city should be the distributing point for coal, by the fact that it is a railroad center. Instead coal shipped to Kansas City and Omaha is transferred to the cars from Milwaukee, Waukegan, Green Bay and Duluth and the freight rate from Duluth is 30 cents, while from Chicago it is 50 cents, because big boats cannot come to Chicago.

"The drainage trustees advertise sites as being located on a ship canal with an inland harbor 32 miles long, when actually boats cannot even enter the river at its mouth. Why don't they improve the river?

"They have agreed to take over the Lawrence avenue pumping station, which cost $1,500,000, to flush the north branch of the river. It was to be in operation Sept. 15. Why isn't it in operation and why do they talk about spending $6,000,000 for the Evanston channel which is to be used for the same purpose? Why don't they take that $6,000,000 in improving and widening the main channel?

"With the proper improvements the tonnage would increase 60 per cent and that would mean millions of dollars expended in the employment of labor which would go directly through commercial channels to the wholesaler and retailer."

SCHOONER WRECKED.

The three-masted ship Lucile, owned by the S. B. Peterson estate, of San Francisco, and chartered by the Red Salmon Canning Co., of that city, was wrecked at the mouth of the Ugashik river, Alaska, Aug. 18. She will become a total loss. The ship was lying in the harbor awaiting favorable tide conditions to get away with her cargo of 39,000 cases of salmon, and 1,200 barrels of fish, when a heavy gale sprang up, the swivel holding the anchor chains snapped and the vessel went ashore on a sand spit. She was released but owing to her anchors having been carried away she was unable to keep in deep water and again went hard aground and commenced to break up. The crew and cannery hands to the number of 168 were safely removed. Arrangements have been made for salving her cargo, valued at $180,000.

ISSUE OF PANAMA BOND.

It is the opinion in banking circles that the treasury department is likely to offer for sale an issue of Panama canal bonds to the amount of $30,000,000 before the end of the year. In the event of such an issue it is expected that bids will be submitted on behalf of one or more New York syndicates. The last Panama canal bonds, which were put out two years ago, were taken by a banking syndicate in New York for resale to national banks. It is believed to be the purpose of the treasury department not to make any further calls on the national banks for the return of public deposits, in which case the bond issue seems all the more probable in order to provide funds for pushing work on the isthmus.

New Orleans shippers and brokers are much interested in the arrival at that port of the first steamer of the Welsford Line, which is to be operated by the W. J. Hammond Agency, for the Gulf Transport Co., of Galveston, in the Liverpool cotton trade. There has been no competition in this field for several years and the outcome of the new venture is somewhat dubious, the Leyland and Harrison steamship companies, having heretofore enjoyed a monopoly of first class liner trade to Liverpool. The Hammond agency states that all the Welsford vessels are rated A1 in insurance classifications so there should be no difficulty in obtaining cargo on that score.

The date of the conference which is to be held in London between representatives of the powers of Europe for the discussion of laws governing maritime warfare has been postponed from Oct. 1 to Dec. 1.

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SHIP YARD NOTES.

The construction of the first vessel at the Craig ship building plant at San Pedro, Cal., was begun recently when steel was received from the east for the electric dredger which is to be built for the Western Marine Dredging Co. The work of cutting and drilling was started at once.

The ship building plant of George H. Miller, at Patchogue, Long Island, was destroyed by a fire of mysterious origin on Aug. 31, with a loss of about $20,000. It is believed to have been the result of an effort to destroy a vessel which was at the plant being repaired.

STEAMSHIP-RAIL RATES RESTORED.

The rate war which was begun some 10 months ago by the Erie railroad in retaliation for irregularities regarding the third-class steamship rates on the part of some of its competitors, has been brought to an end by an agreement entered into by the interested lines to restore the regular tariff in effect before the disagreement. Notice has been given to the Interstate Commerce Commission to this effect.

OBITUARY.

Capt. George H. Morden died at Oakville, Ont., recently. He retired but a few weeks ago to live on his farm at Oakville.

Rear Admiral James Kelsey Cogswell, retired, died at his country home near Jacksonville, Fla., Aug. 12, at the age of 61. The interment took place at Portsmouth, N. H.

Capt. Stephen J. Roe, one of the best known of the Hudson river steamboat men, died at his home at Albany, Aug. 26, at the age of 83. He had followed the river for more than 60 years, for 50 of which he was employed by the People's line. For 33 years he commanded that company's night boat Drew. During all his years of service Capt. Roe never had an accident.

Commander Henry McCrea, U. S. N., who commanded the battleship Georgia during the cruise of the Atlantic fleet to the Pacific coast, died July 19 at the Naval Hospital at Brooklyn, N. Y., at the age of 57. Commander McCrea had been in the navy since 1876 and had held many important posts. He was relieved of the command of the battleship Georgia some weeks ago and placed in charge of the lighthouse corps, being stationed at Staten Island. The strain of the trip around the Horn, however, had so broken his health that recovery was impossible.

Capt. George Loring, commander for many years of the United States steamship Resolute, died Sunday, July 12, at his home in South Boston, Mass. Capt. Loring was born in Barnstable, Mass., Feb. 24, 1824, and followed the sea from the age of nine. He took command of the United States steamer Resolute Nov. 14, 1879, and continued therein until 1900 when the vessel was wrecked. During this period he became very well known to the officers and men of the regular army from having transported them about Boston harbor.

Theodore S. Fassett, lumber dealer and vessel owner on the Niagara frontier, died at his home in Buffalo recently. He began business life as bookkeeper for the late Wl H. Gratwick. Seven years later he removed to Tonawanda and became a member of the firm of Lane, Fassett & Co. in the lumber forwarding business. He later associated himself with James R. Smith under the firm name of Smith, Fassett & Co., of which firm he had been senior member since the death of Mr. Smith in 1904. Mr. Fassett had been active in many enterprises of a pubilc nature. He leaves a widow and one daughter, Clara S. Fassett.

Rear Admiral Edwin Fithian, U. S. N., retired, who was the oldest officer of the United States navy, and one of the most distinguished engineers in the service, died at his home at Bridgeton, N. J., Aug. 29, in his 88th year. Admiral Fithian was born in New York state Dec. 1, 1820, and was one of the few officers of the navy who was not an Annapolis graduate. He entered the navy in October, 1848, as a third assistant engineer, his appointment being accredited to Pennsylvania. His rise in the service was rapid, and in less than a year after he received his commission he was recognized as an unusually capable engineering officer. After the war and until his retirement in 1882, after 40 years' continuous service, Admiral Fithian held nearly every important engineering position, with the exception of that of chief of the bureau of engineering at Washington.

BIDS FOR DAM WORK.

Bids received by Col. William T. Rossell, corps of engineers, U. S. army, Cincinnati, O., opened Sept. 10, for the construction of a dam of concrete at the head of Brown's Island, Ohio river, were as follows:

Advance Sand & Construction Co., Pittsburg, Pa.	$44,670.75
Pennsylvania Contracting Co., Pittsburg, Pa.	49,684.00
H. E. Talbott Co., Dayton, O.	58,045 00
J. C. Thomas, Louisa, Ky.	49,540.50

BIDS FOR REPAIRING LIGHT VESSEL.

Bids for making repairs to light vessel No. 43, opened at the office of the inspector of the New Orleans, La., district, on Aug. 10, were as follows:

*McLellan Dry Dock Co., New Orleans, La.	$1,887
Johnson Iron Works, Ltd., New Orleans, La.	1,977
Stern Foundry & Machinery Co., New Orleans, La.	3,253

*Accepted.

BIDS FOR TOWBOAT.

Abstract of proposals for building a wooden-hull towboat, with snagging appliances, for use on the Kentucky River, Kentucky, received in response to advertisement dated Aug. 20, 1908, and opened Sept. 9, 1908, by Lieut. Col. J. G. Warren, Corps of Engineers, U. S. Army, at Cincinnati, O.:

Items—	(1) Howard Ship Yards Co., Jeffersonville, Ind.	(2) J. M. Hammitt, Marietta, O.
For constructing towboat, with snagging appliances:		
(a) If of new machinery and equipment throughout	$30,000.00	.....
(b) If of certain parts of machinery taken from U. S. Steamer General O. M. Poe	24,600.00	$32,575.00
Bidder proposes to purchase U. S. Steamer General O. M. Poe, exclusive of furniture and funishings, for the sum of	1,000.00	400.00
Number of days from date of approval of contract in which the bidder proposes to make delivery of boat at Frankfort, Ky.	150	150

DREDGING AT NORFOLK.

Bids opened by Maj. Joseph E. Kuhn on Sept. 14:

	Dredging C. Yd. Scow Measure.	Estimated Quantity, Cu. Yds.
L. M. Lewis Dredging Co.	14.30c	60,000
Coastwise Dredging Co.	16.50c	
Norfolk Dredging Co.	19.75c	

All of Norfolk, Va.

BIDS FOR DREDGING AT EVANSVILLE, IND.

Bids for dredging the harbor at Evansville, Ind., received by Col. William T. Rossell, corps of engineers, U. S. army, on Aug 31, were as follows:

	Per cu. yd.
Ohio River Contract Co., Evansville, Ind.	20c
Monongahela & Western Dredging Co., Pittsburg, Pa.	33c
Sheridan-Kirk Contract Co., Cincinnati, O.	20½c

BIDS FOR DREDGING IN DELAWARE RIVER.

Bids for dredging in sections 1, 3 and 5-A of the Delaware river, received by Major Herbert Deakyne, corps of engineers, U. S. army, and opened Sept. 5, 1908, were as follows:

Maryland Dredging & Contract Co., Baltimore, Md.	$273,280
American Dredging Co., Philadelphia, Pa.	259,784

FOR SALE, Four single-geared 8 in. x 10 in., and one double-geared 8 in. x 8 in. double-cylinder mooring winches. Singled-geared machines have 14 in. diameter x 16 in. drum; double-geared machine has 16 in. diameter x 16 in. drum. All machines have gypsy head on one end, hand operating attachment and balanced reverse valve. Machines are very strong construction, have never been used and will make fine outfit for a modern steamer. Price moderate. Address "Moderate" care MARINE REVIEW.

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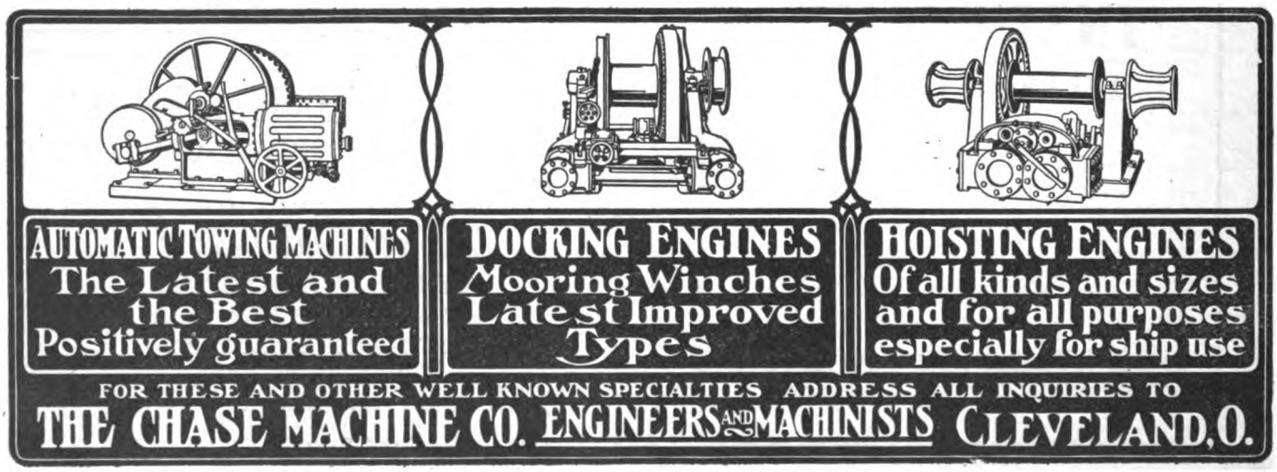
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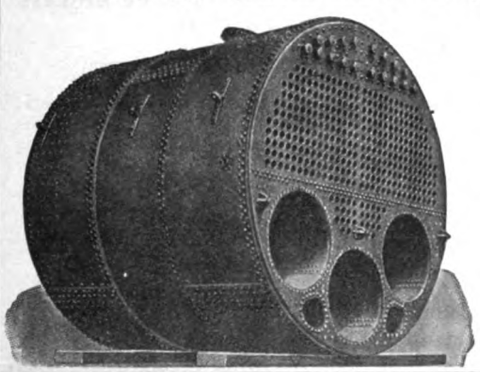

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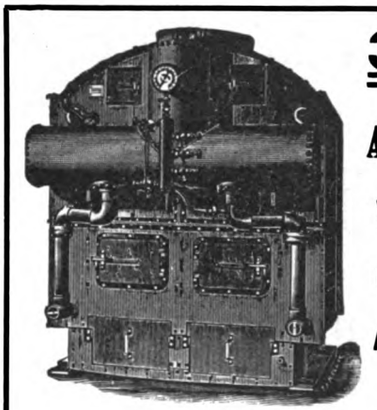

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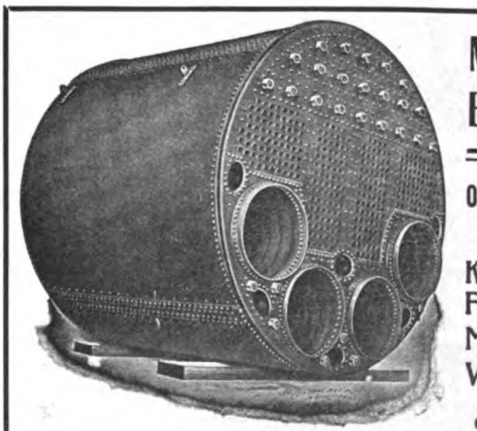

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